

Fig. 1

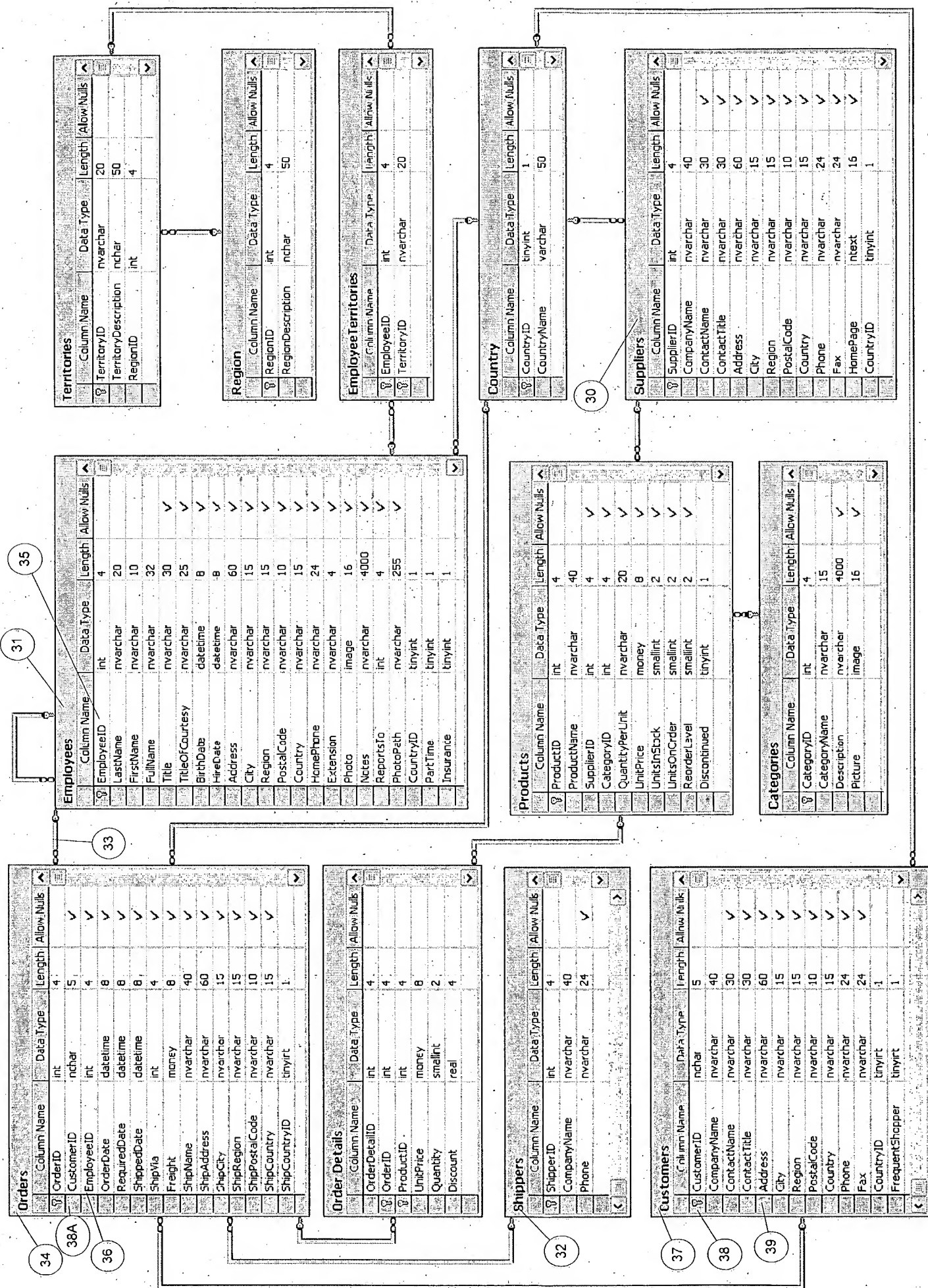


Fig. 2

41	Customer View				
	Metadata Name	Metadata Type	Source(s)	Source Name(s)	Source Type(s)
	Company Name	Field	Customers	CompanyName	Field
	Contact Name	Field	Customers	ContactName	Field
	Contact Title	Field	Customers	ContactTitle	Field
45	Address	Field	Customers	Address	Field
	City	Field	Customers	City	Field
	Region	Field	Customers	Region	Field
	Postal Code	Field	Customers	PostalCode	Field
	Country	Relation	Customers/Country	CountryID	Field/Key
	Phone	Field	Customers	Phone	Field
	Fax	Field	Customers	Fax	Field
44	Frequent Shopper	Field	Customers	FrequentShopper	Field
	Customers	Aggregation Field	Customer View	Customers	Aggregation Field
46	Orders	Relation	Customers/Orders	CustomerID	Field/Key Field

49	Employee View				
	Metadata Name	Metadata Type	Source(s)	Source Name(s)	Source Type(s)
53	Full Name	Field	Employees	FullName	Field
	First Name	Field	Employees	FirstName	Field
	Last Name	Field	Employees	LastName	Field
	Title of Courtesy	Field	Employees	TitleOfCourtesy	Field
	Title	Field	Employees	City	Field
	Hire Date	Field	Employees	HireDate	Field
	Birth Date	Field	Employees	BirthDate	Field
	Address	Relation	Employees	Address	Field
	City	Field	Employees	City	Field
	Region	Field	Employees	Region	Field
	Postal Code	Field	Employees	PostalCode	Field
	Country	Relation	Employees/Country	CountryID	Field/Key Field
	Home Phone	Field	Employees	HomePhone	Field
	Extension	Field	Employees	Extension	Field
	Insurance	Field	Employees	Insurance	Field
	Part Time	Field	Employees	PartTime	Field
	Employees	Aggregation Field	Employee View	Employees	Aggregation Field
	Employee Territories	Relation	Employees/Employee Territories	EmployeeID	Key Field/Key Field
54	Orders	Relation	Employees/Orders	EmployeeID	Key Field/Field
	Reports To	Relation	Employees/Employees	ReportsTo	Field/Key Field
	Subordinates	Relation	Employee View	EmployeeID	Field

50	Employee Territories View				
	Metadata Name	Metadata Type	Source(s)	Source Name(s)	Source Type(s)
	Employee Territories	Aggregation Field	Employee Territories	Employee Territories	Aggregation Field
	Employee	Relation	Employee Territories/ Employees	EmployeeID	Key Field/Key Field
	Territory	Relation	Employee Territories/ Territories	TerritoryID	Key Field/Key Field

Fig. 3A

Orders View				
Metadata Name	Metadata Type	Source(s)	Source Name(s)	Source Type(s)
Order Date	Field	Orders	OrderDate	Field
Required Date	Field	Orders	RequiredDate	Field
Shipped Date	Field	Orders	ShippedDate	Field
Ship Name	Field	Orders	ShipName	Field
Ship Address	Field	Orders	ShipAddress	Field
Ship City	Field	Orders	ShipCity	Field
Ship Region	Field	Orders	ShipRegion	Field
Ship Postal Code	Field	Orders	ShipPostalCode	Field
Ship Country	Relation	Orders/Country	ShipCountryID/ CountryID	Field/Key Field
Shipper	Relation	Orders/Shippers	ShipVia/ShipperID	Field/Key Field
Freight	Field	Orders	Freight	Field
Order Total	Expression	Order View	Order Details/Sum Item Amount + Freight	
Orders	Aggregation Field	Order View	Orders	Aggregation Field
Sum Freight	Aggregation Field	Orders	Freight	Aggregation Field
Sum Order Total	Aggregation Field	Orders/Order Details/Products	OrderID/OrderID /ProductID/UnitPrice	Aggregation Field
Avg Freight	Aggregation Field	Orders	Freight	Aggregation Field
Avg Order Total	Aggregation Field	Order View	Order Total	Aggregation Field
Avg #Items per Order	Aggregation Field	Orders/Order Detail	OrderDetailID	Aggregation Field
First Order Date	Aggregation Field	Orders	OrderDate	Aggregation Field
Last Order Date	Aggregation Field	Orders	OrderDate	Aggregation Field
First Required Date	Aggregation Field	Orders	RequiredDate	Aggregation Field
Last Required Date	Aggregation Field	Orders	RequiredDate	Aggregation Field
First Shipped Date	Aggregation Field	Orders	ShippedDate	Aggregation Field
Last Shipped Date	Aggregation Field	Orders	ShippedDate	Aggregation Field
Customer	Relation	Orders/Customers	CustomerID	Field/Key Field
Employee	Relation	Orders/Employees	EmployeeID	Field/Key Field
Order Details	Relation	Orders/Order Details	OrderID	Key Field/Key Field

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Order Detail View				
Metadata Name	Metadata Type	Source(s)	Source Name(s)	Source Type(s)
Unit Price	Field	Order Details	UnitPrice	Field
Quantity	Field	Order Details	Quantity	Field
Discount	Field	Order Details	Discount	Field
Item Amount	Expression	Order Detail View	Unit Price * Quantity * (1 - Discount)	
Order Details	Aggregate Field	Order Details	OrderDetailID	Aggregation Field
Sum Item Amount	Aggregate Field	Order Detail View	Item Amount	Aggregation Field
Avg Item Amount	Aggregation Field	Order Details/ Order Detail View	OrderDetailID/ Item Amount	Aggregation Field
Avg Quantity	Aggregation Field	Order Details/ Order Detail View	Quantity/Order Details	Aggregation Field
Avg Discount	Aggregation Field	Order Details/ Order Detail View	Discount/Order Details	Aggregation Field
Order	Relation	Order Details/Orders	OrderID	Key Field/Key Field
Product	Relation	Order Details/ Products	ProductID	Key Field/Key Field

Fig. 3B

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Product View				
Metadata Name	Metadata Type	Source(s)	Source Name(s)	Source Type(s)
Product Name	Field	Products	ProductName	Field
Unit Price	Field	Products	UnitPrice	Field
Units In Stock	Field	Products	UnitsInStock	Field
Units On Order	Field	Products	UnitsOnOrder	Field
Quantity Per Order	Field	Products	QuantityPerOrder	Field
Reorder Level	Field	Products	ReorderLevel	Field
Discontinued	Field	Products	Discontinued	Field
Products	Aggregation Field	Products	ProductID	Aggregation Field
Sum Unit Price	Aggregation Field	Products	UnitPrice	Aggregation Field
Avg Unit Price	Aggregation Field	Products/Product View	UnitPrice/Products	Aggregation Field
Avg Units In Stock	Aggregation Field	Products/Product View	UnitsInStock/Products	Aggregation Field
Avg Units On Order	Aggregation Field	Products/Product View	UnitsOnOrder/Products	Aggregation Field
Category	Relation	Products/Categories	CategoryID	Field/Key Field
Supplier	Relation	Products/Suppliers	SupplierID	Field/Key Field
Order Details	Relation	Products/Order Details	ProductID	Key Field/Key Field

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Supplier View				
Metadata Name	Metadata Type	Source(s)	Source Name(s)	Source Type(s)
Company Name	Field	Suppliers	CompanyName	Field
Contact Name	Field	Suppliers	ContactName	Field
Contact Title	Field	Suppliers	ContactTitle	Field
Address	Field	Suppliers	Address	Field
City	Field	Suppliers	City	Field
Region	Field	Suppliers	Region	Field
Postal Code	Field	Suppliers	PostalCode	Field
Phone	Field	Suppliers	Phone	Field
Fax	Field	Suppliers	Fax	Field
Suppliers	Aggregation Field	Suppliers	SupplierID	Aggregation Field
Country	Relation	Suppliers/Country	CountryID	Field/Key Field
Products	Relation	Suppliers/Products	SupplierID	Key Field/Field

Fig. 3C

Table 50 - Database Object Properties		
No.	Name	Contents and Purpose
D01	dbUtilityTypeName	"string" containing the name of the object type used to access the referenced database
D02	connectionString	"string" containing location, access method and security associated with the referenced database

Table 51 - View Object Properties		
No.	Name	Contents and Purpose
V01	databaseID	Contains the name or token of the associated database
V02	sourceTable	Contains the name of the table in the associated database
V03	requireFilterForDetails	"true" or "false" - Determines if a query using the view requires a filter before processing a query. Usually set to "false" if the number of records in the associated database are voluminous
V04	primaryKey keyColumn	Identifies a primary key column of the associated table
V05	primaryKey dataType	Identifies the data type of a primary key column
	defaultFields	Identifies the field(s) used by the system as the default field(s) when a view associated with a relation is included in a report without following the relation
V06	defaultAggregateFields	Identifies the field(s) used by the system as the default field(s) when a view associated with a relation is included in a report without following the relation, and the relation path includes at least one to-many relationship

Table 52 - Field Object Properties		
No.	Name	Contents and Purpose
F01	databaseID	Name or token of associated database
F02	viewID	Name or token of associated view
F03	sourceColumn	Name of column in associated view
F04	dataType	"text", "numeric", "dateTime" or "boolean" - Type of data of records returned based upon field.
F05	allowAsGroupField	"true" or "false" - Identifies whether field may be used for grouping
F06	allowDrill	"true" or "false" - Identifies whether field may be used to create a drill report
F07	field type	"aggregate" - Used for aggregation or summary fields "expression" - Used for calculated expression fields
F08	field function	Function name - Used to identify the aggregate function to be applied to field values
F09	description	Custom description of field

Table 53 - Relation Object Properties		
No.	Name	Contents and Purpose
R01	databaseID	Name or token of associated database
R02	viewID	Name or token of associated view
R03	toViewID	Metadata view object to be used to display the fields and relations for a followed relation
R04	reverseID	Metadata relation object representing the reverse direction of this relation
R05	relationType	"OneToMany," "OneToOne" or "ManyToOne" - Defines the cardinality of the relation from the perspective of the "from" view
R06	joinType	"LeftOuterJoin" or "InnerJoin" - Default value is LeftOuterJoin. InnerJoin is generally set for ManyToOne relationships, while LeftOuterJoin is set for OneToMany relationships.
R07	joinKey sourceColumn	Join key column of the database table associated with the transferring view
R08	joinKey destColumn	Join key column of the database table associated with the transferred to view
R09	joinKey dataType	"text," "numeric," "dateTime," "boolean" - Data type of the join key column

Fig. 3D

Database Object

```
<?xml version="1.0" encoding="utf-8" ?>
<object xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:type="database"
  dbUtilityTypeName="ActiveViews.Server.SQLProviders
    .SqlServerProvider.SqlServerDbUtility, ServerLibrary"
  connectionString="Initial Catalog=AVnwcomplete;
    Data Source=(local);Integrated Security=true">
  <dbUtilityProperties g:commandTimeout="180"
    xmlns:g="http://activeviews.net/SQLProviders/DbUtility/Generic" />
</object>
```

Customer View Object

```
<?xml version="1.0" encoding="utf-8" ?>
<object xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:type="view"
  databaseID="1218"
  sourceTable="Customers"
  requireFilterForDetails="false">
  <primaryKey keyColumn="CustomerID" dataType="Text" />
  <defaultFields>
    <field ref="northwind\Customer\Company Name" />
  </defaultFields>
  <defaultAggregateFields>
    <!-- Customer\Customers (count) -->
    <field ref="1228" type="aggregate" />
  </defaultAggregateFields>
</object>
```

Address Source Field Object

```
<?xml version="1.0" encoding="utf-8" ?>
<object xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:type="savedSourceField"
  databaseID="1218" viewID="northwind\Customer"
  sourceColumn="Address" dataType="Text">
  <field allowAsGroupField="false" />
</object>
```

Orders Relation Object

```
<?xml version="1.0" encoding="utf-8" ?>
<object xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:type="relation" databaseID="1218"
  viewID="northwind\Customer" toViewID="northwind\Order"
  reverseID="northwind\Order\Customer" relationType="OneToMany">
  <join joinType="LeftOuterJoin">
    <joinKey sourceColumn="CustomerID" destColumn="CustomerID" dataType="Text" />
  </join>
</object>
```

Customer Relation Object

```
<?xml version="1.0" encoding="utf-8" ?>
<object xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:type="relation" databaseID="1218"
  viewID="northwind\Order"
  toViewID="northwind\Customer"
  reverseID="northwind\Customer\Orders" relationType="ManyToOne">
  <join joinType="InnerJoin">
    <joinKey sourceColumn="CustomerID" destColumn="CustomerID" dataType="Text" />
  </join>
</object>
```

Fig. 3E

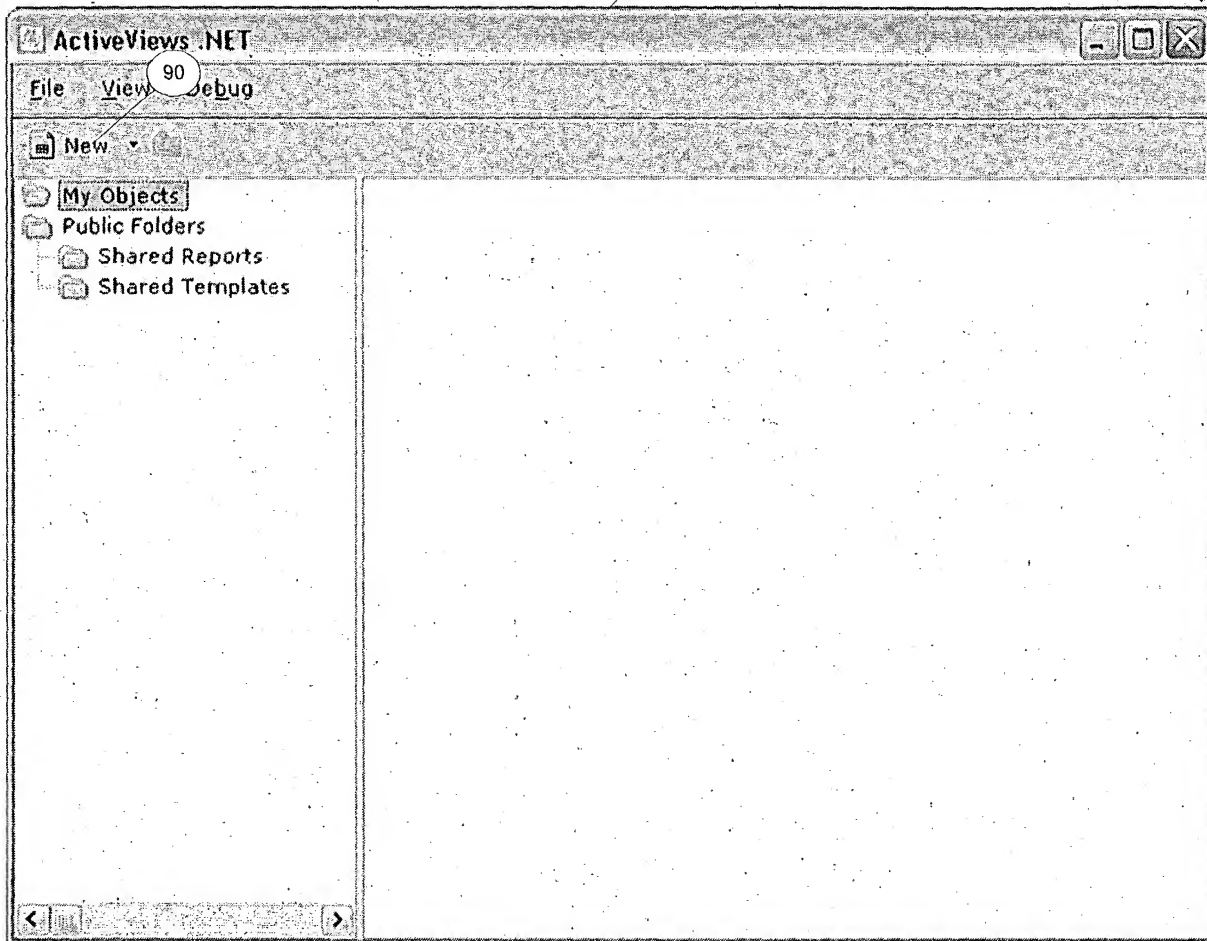


Fig. 4

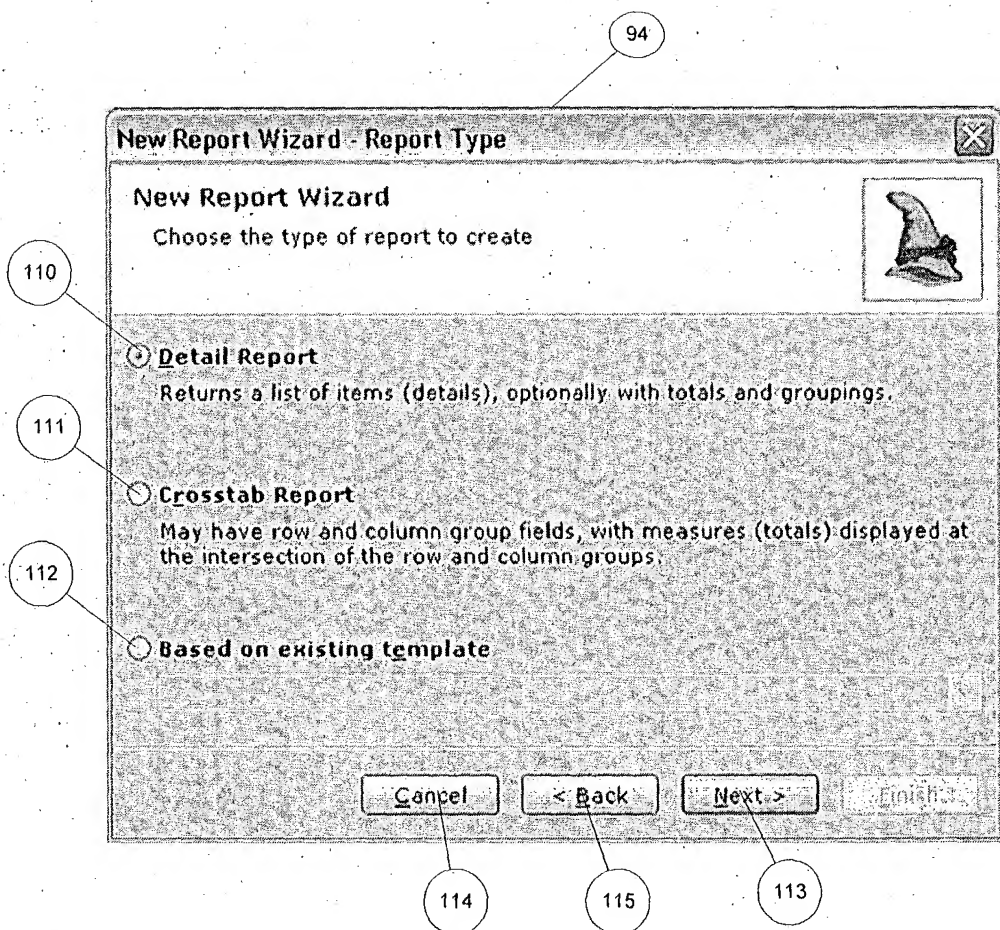


Fig. 5

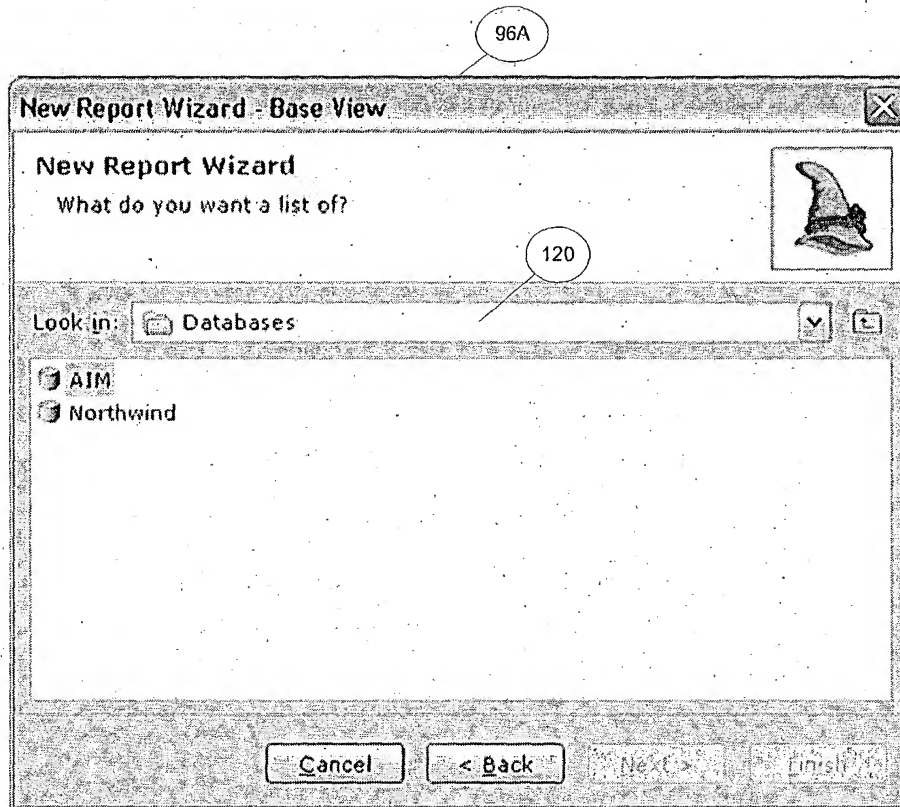


Fig. 6A

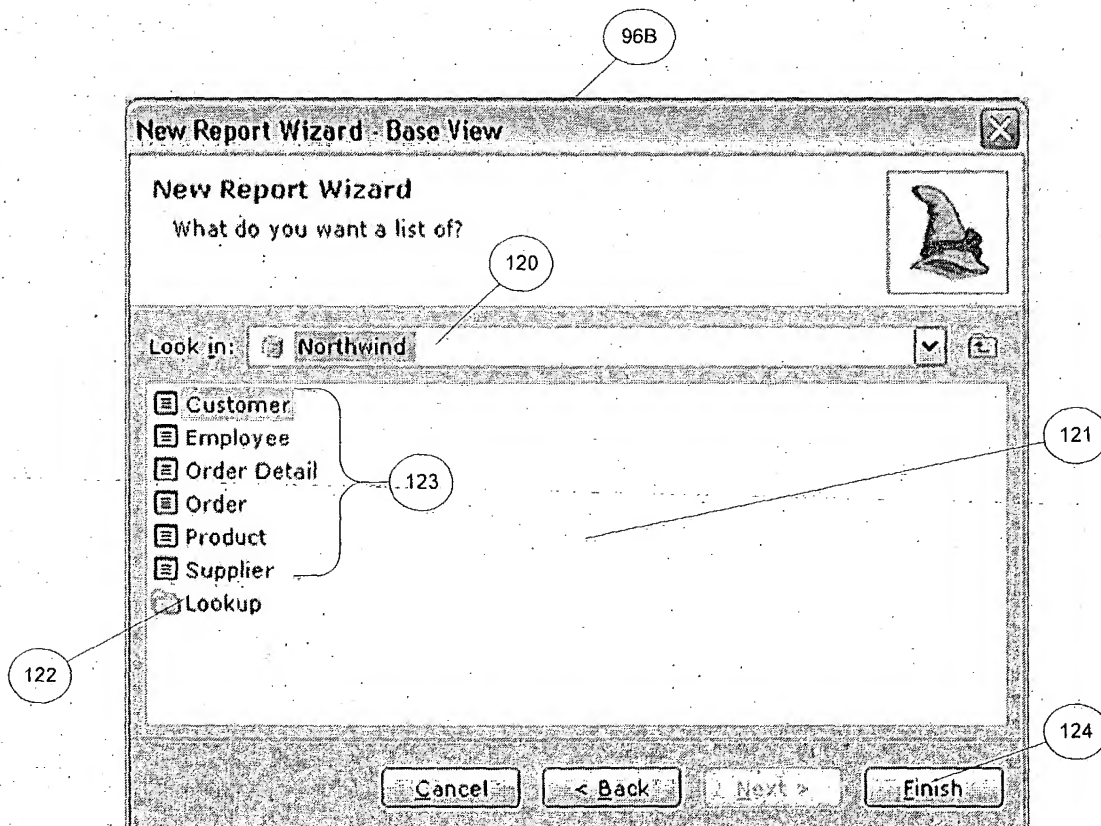


Fig. 6B

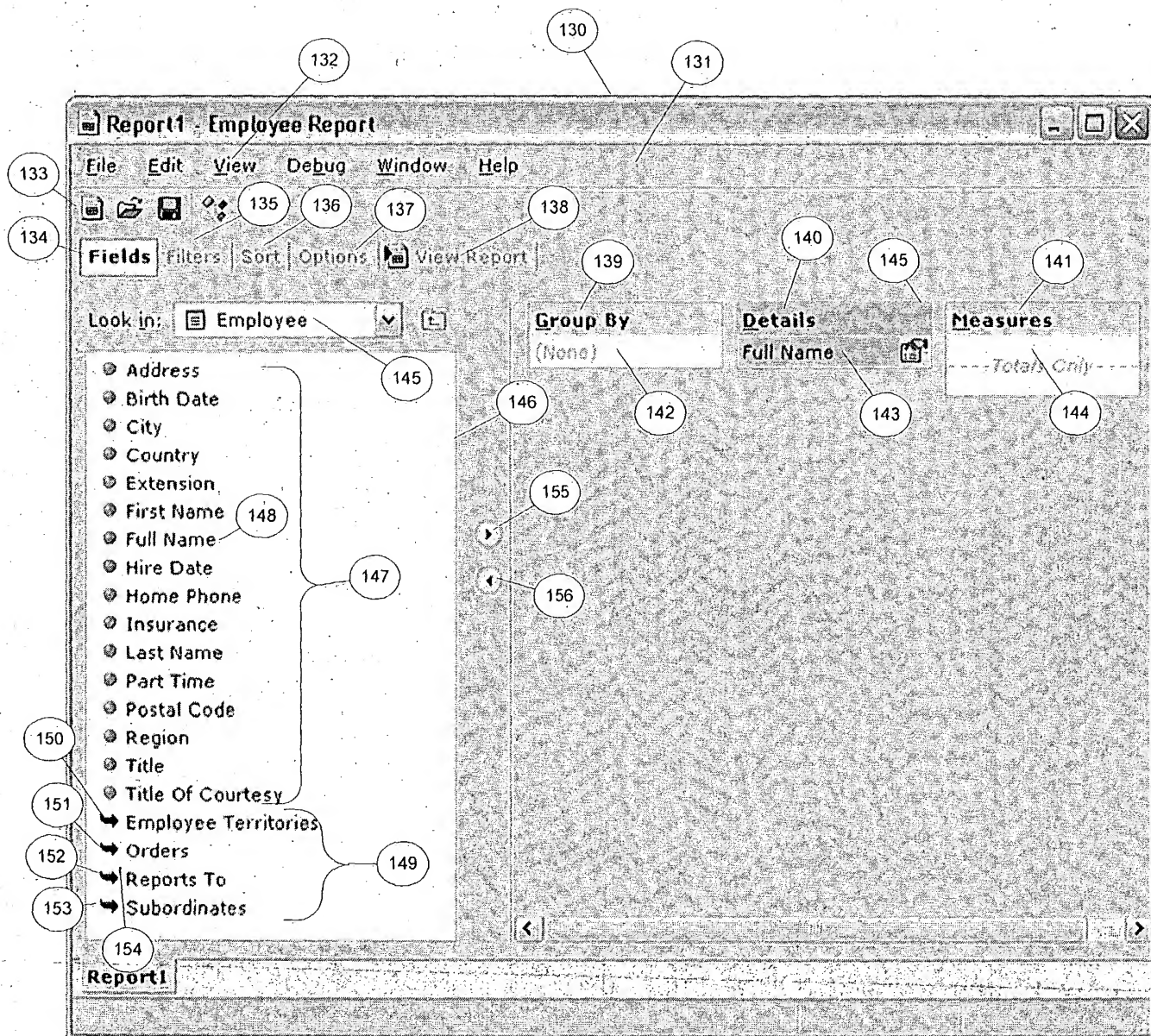


Fig. 7

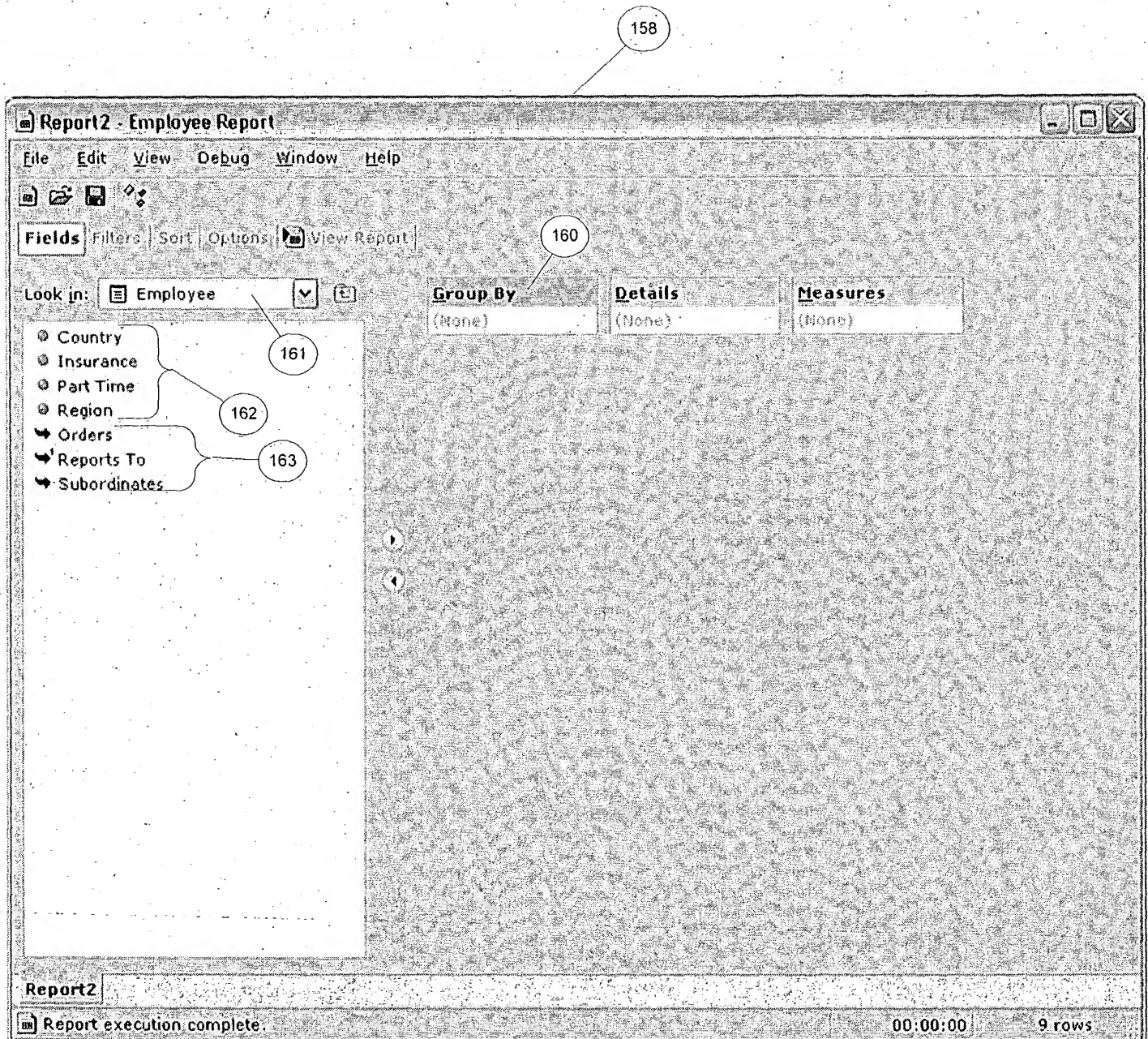


Fig. 8

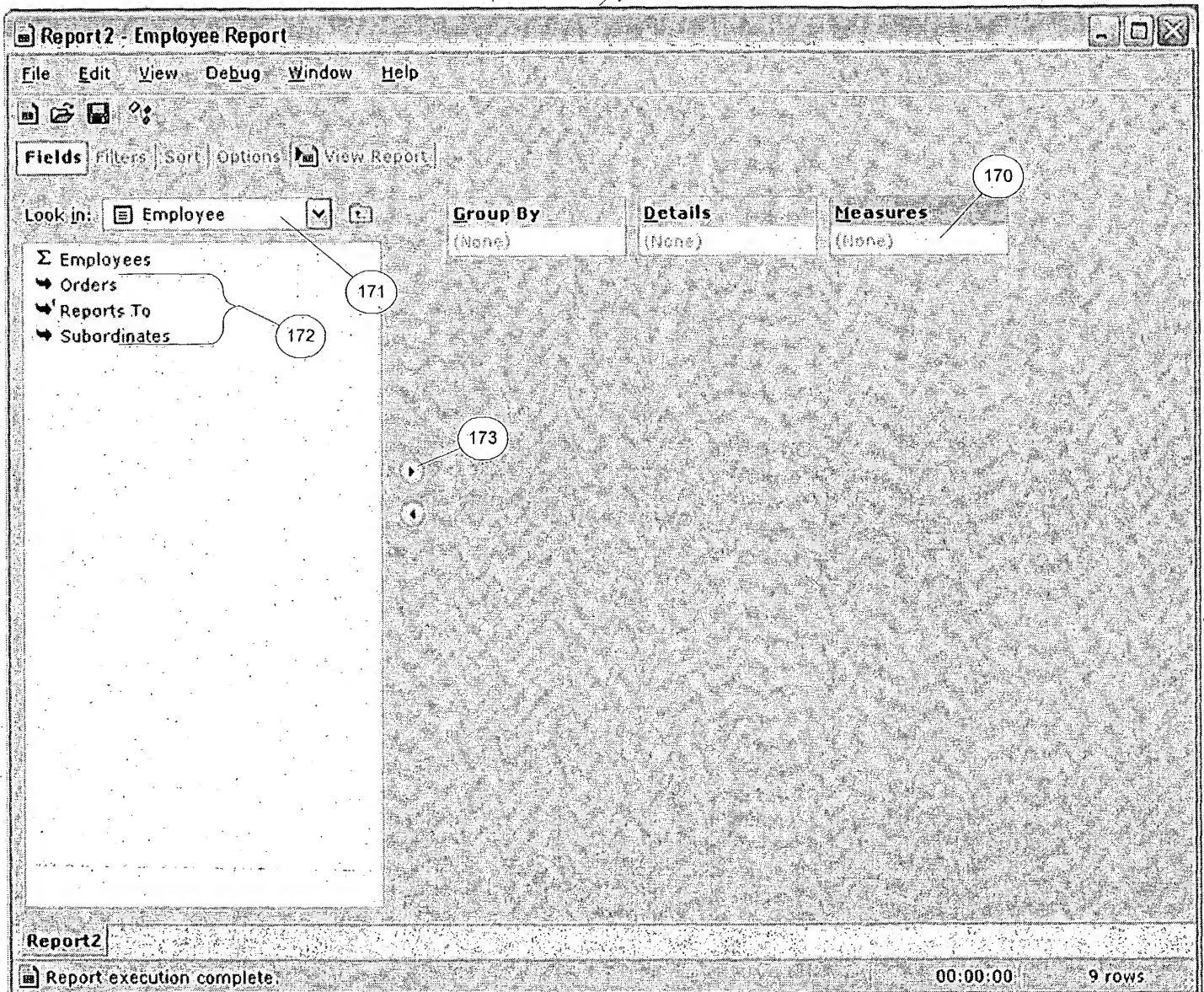


Fig. 9

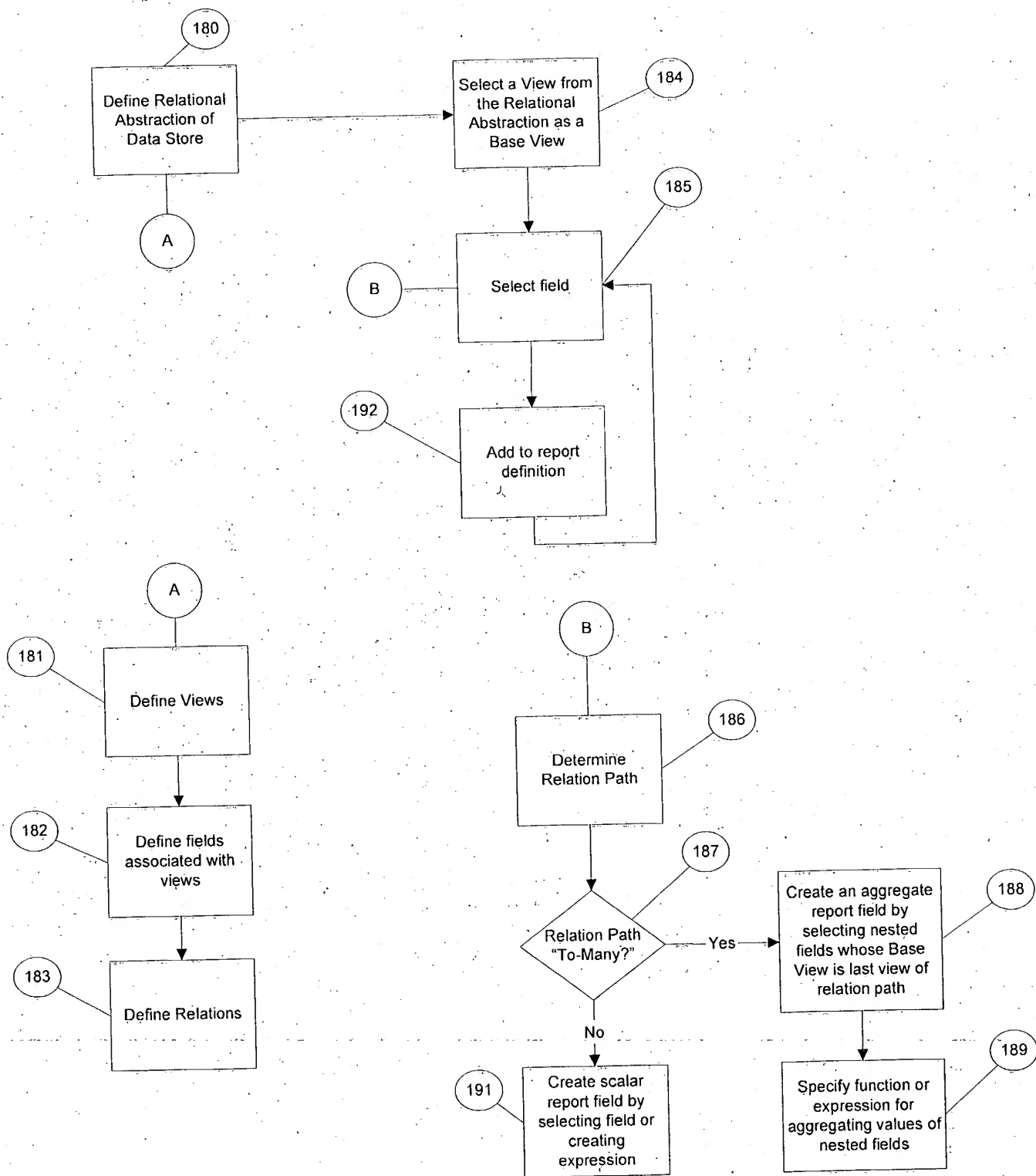


Fig. 10A

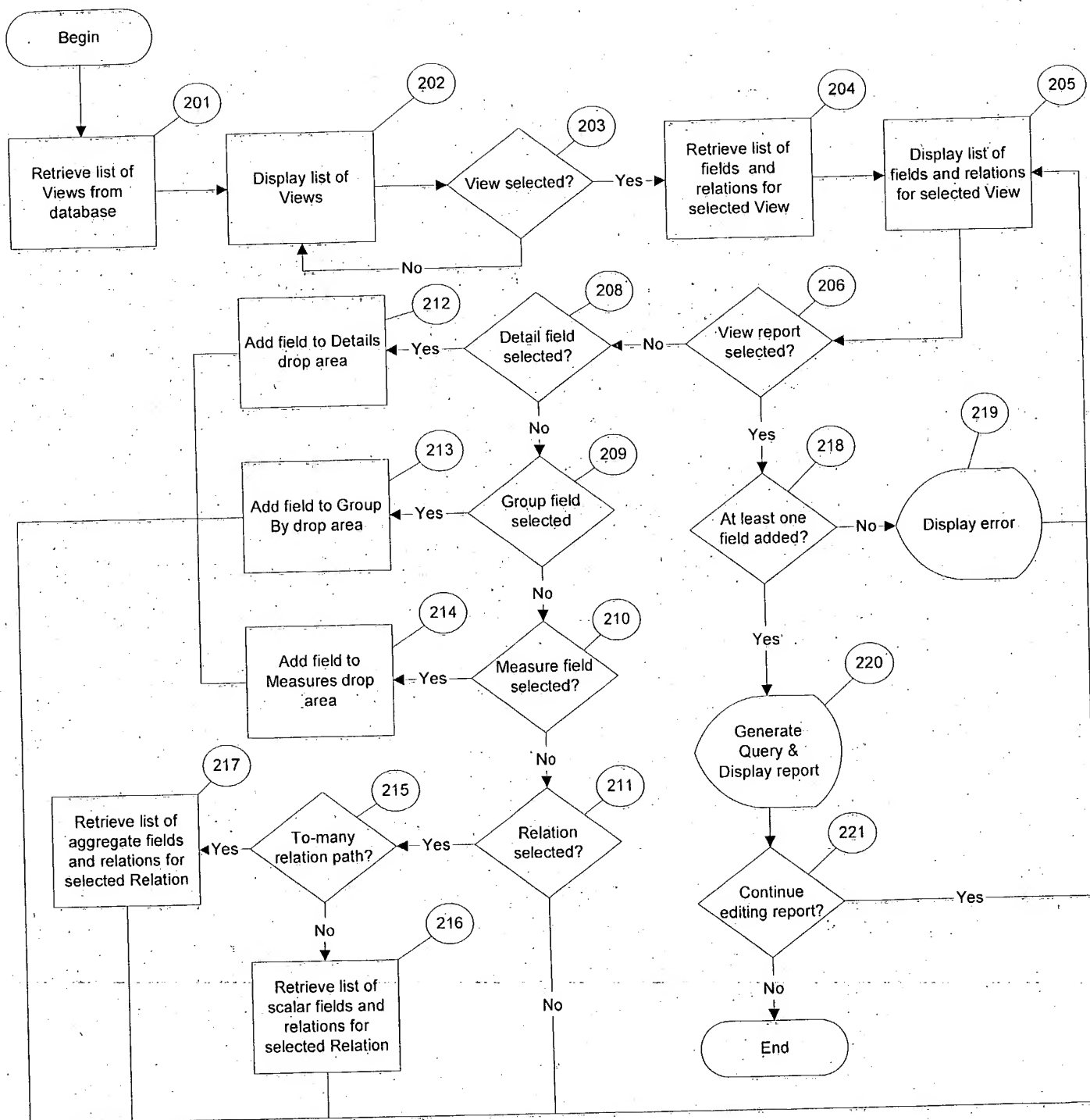
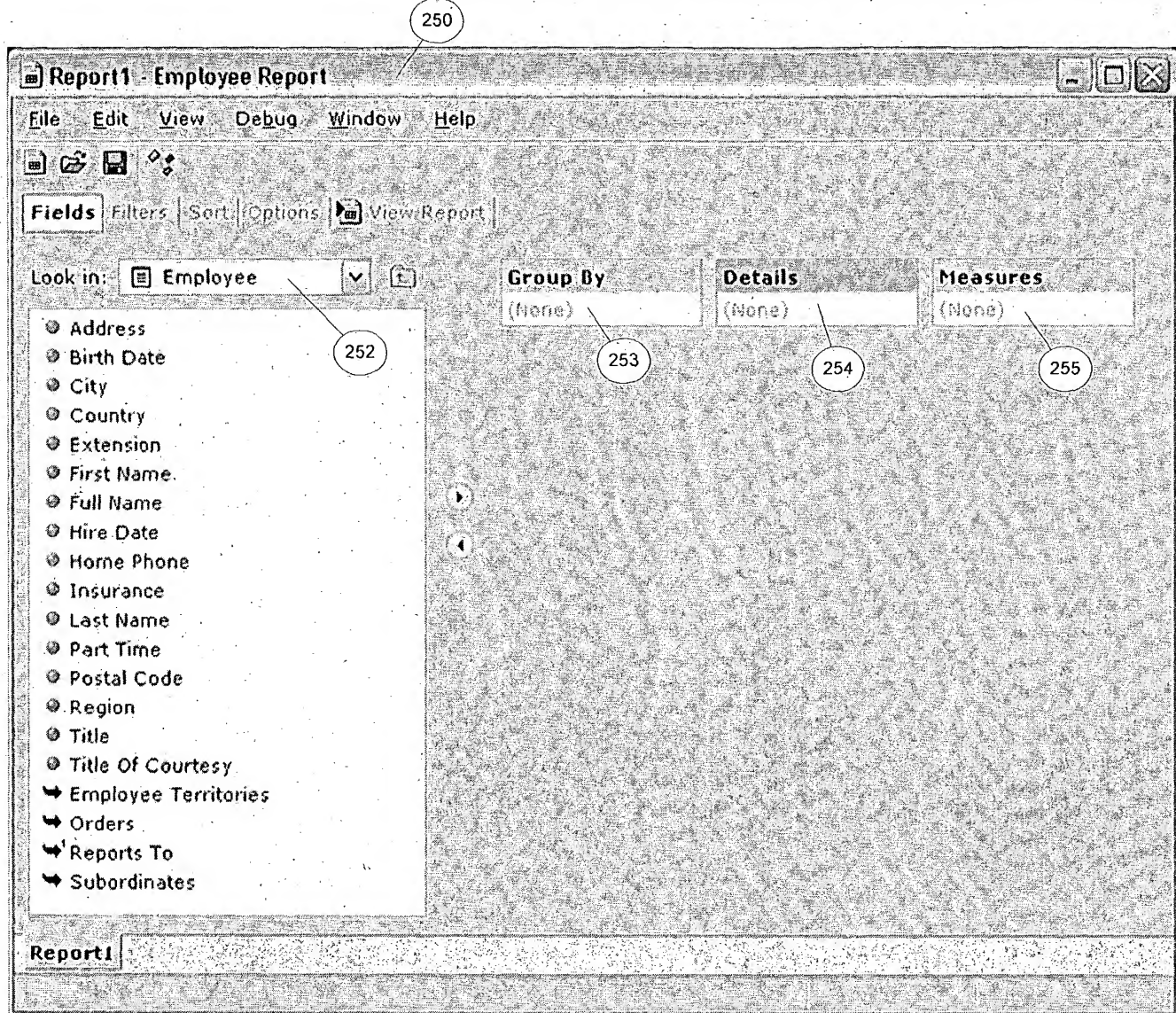


Fig. 10B



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XML Report Definition Table

```
<?xml version="1.0" encoding="utf-8" ?>
<reportDefinition baseViewID="Employee" name="Report1" type="detail">
</reportDefinition>
```

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Fig. 11A

260

Report1 - Employee Report

File Edit View Debug Window Help

Fields Filters Sort Options View Report

Look in: Employee

- Address
- Birth Date
- City
- Country
- Extension
- First Name
- Full Name
- Hire Date
- Home Phone
- Insurance
- Last Name
- Part Time
- Postal Code
- Region
- Title
- Title Of Courtesy
- Employee Territories
- Orders
- Reports To
- Subordinates

Group By (None)

Details	Measures
Full Name	Totals Only
Title	
Hire Date	

Report1

262

261

XML Report Definition Table

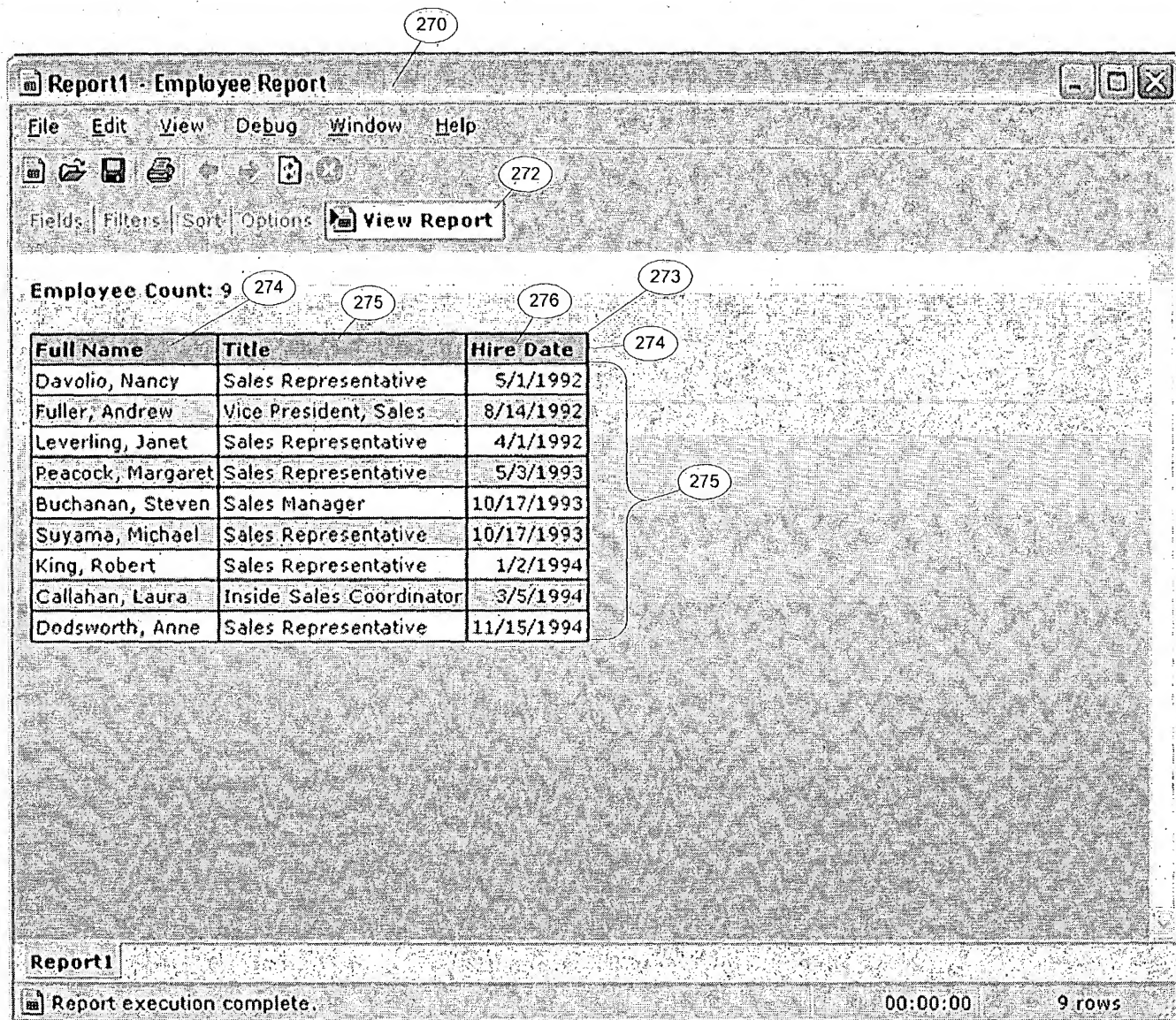
```

<?xml version="1.0" encoding="utf-8" ?>
<reportDefinition baseViewID="Employee" name="Report1" type="detail">
  <detailFields>
    <field id="1" ref="Full Name" />
    <field id="2" ref="Title" />
    <field id="3" ref="Hire Date" />
  </detailFields>
</reportDefinition>

```

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Fig. 11B

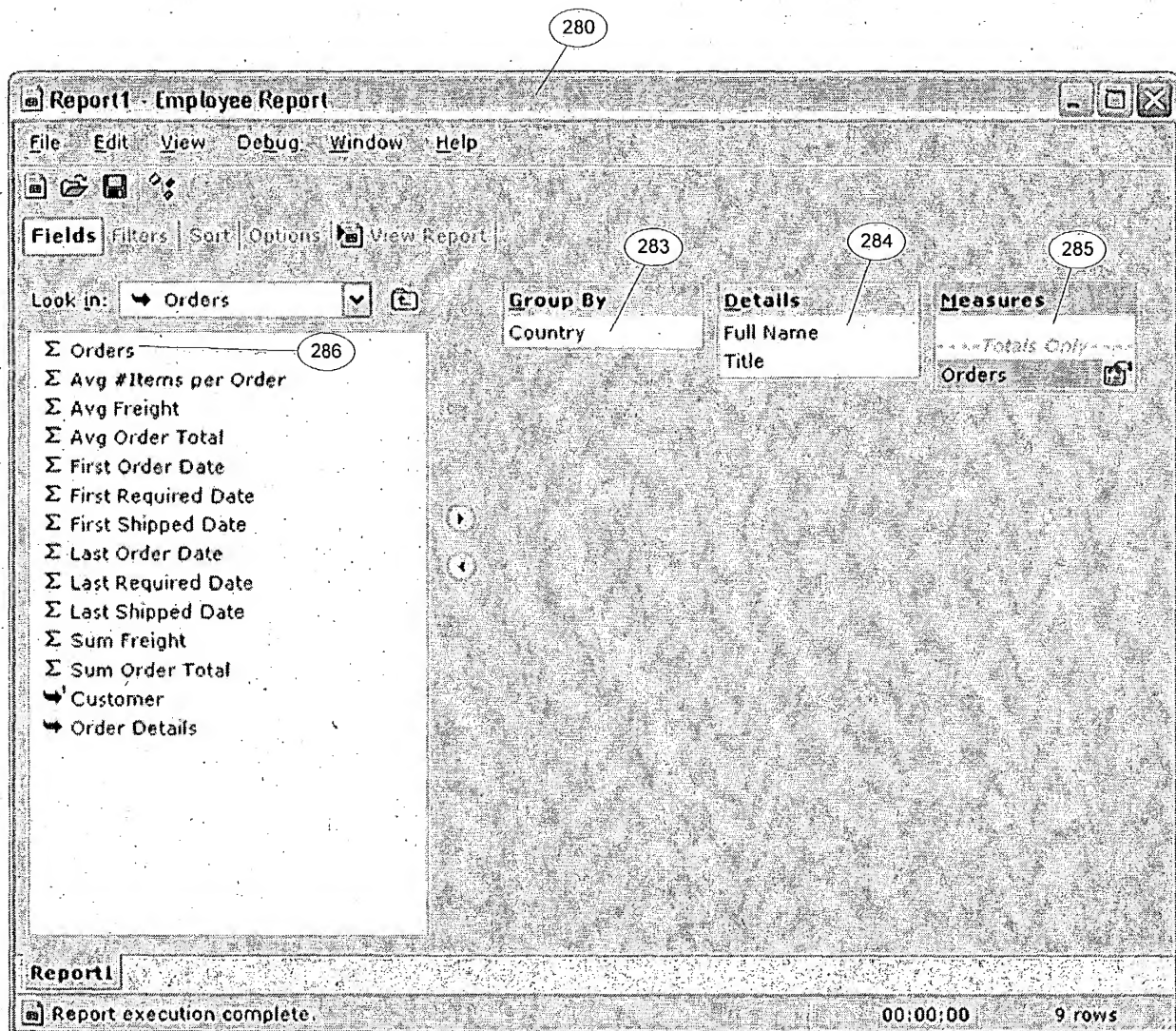


SQL Query Table

```

SELECT bv.EmployeeID AS fpk_k0,
       0 AS fpk_g,
       bv.FullName AS f1,
       bv.Title AS f2,
       bv.HireDate AS f3
FROM Employees bv
ORDER BY fpk_g, fpk_k0
  
```

Fig. 11C



XML Report Definition Table

```
<?xml version="1.0" encoding="utf-8" ?>
<reportDefinition baseViewID="Employee" name="Report1" type="detail">
  <detailFields>
    <field id="1" ref="Full Name" />
    <field id="2" ref="Title" />
  </detailFields>
  <groupFields axis="1">
    <field id="5" type="rowRef">
      <relationPath relationID="Country" />
      <detailFields>
        <field id="4" ref="Country" />
      </detailFields>
    </field>
  </groupFields>
  <measureFields>
    <field id="6" type="aggregate" ref="Orders" totalsOnly="true">
      <relationPath />
      <relationPath relationID="Orders" />
    </field>
  </measureFields>
  <reportOptions>
    <displayTotals hierarchyRows="true" />
  </reportOptions>
</reportDefinition>
```

Fig. 11D

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Report1 Employee Report

File Edit View Debug Window Help

Fields Filters Sort Options View Report

Employee Count: 9

293 294

Country	Full Name	Title
UK	Buchanan, Steven	Sales Manager
	Suyama, Michael	Sales Representative
	King, Robert	Sales Representative
	Dodsworth, Anne	Sales Representative
	Orders	224
USA	Davolio, Nancy	Sales Representative
	Fuller, Andrew	Vice President, Sales
	Leverling, Janet	Sales Representative
	Peacock, Margaret	Sales Representative
	Callahan, Laura	Inside Sales Coordinator
	Orders	606
	Orders	830

292 295

Report1

Report execution complete 00:00:00 9 rows

291

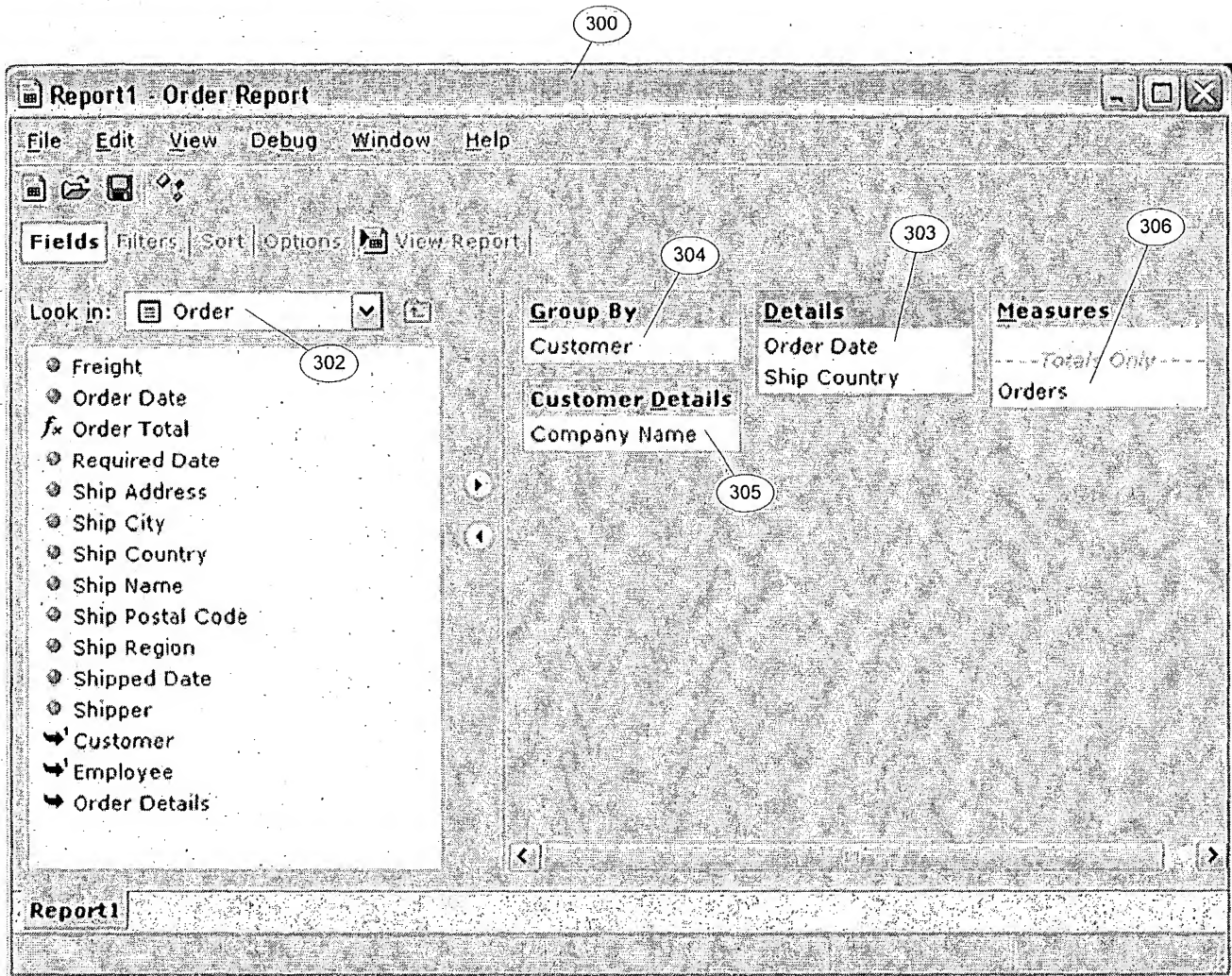
SQL Query Table

```

SELECT q0.f5_k0 AS f5_k0,
    GROUPING(q0.f5_k0) AS f5_g,
    bv.EmployeeID AS fpk_k0,
    GROUPING(bv.EmployeeID) AS fpk_g,
    CASE WHEN GROUPING(q0.f5_k0)=0 THEN MIN(q0.f4) ELSE NULL END AS f4,
    CASE WHEN GROUPING(bv.EmployeeID)=0 THEN MIN(bv.FullName) ELSE NULL END AS f1,
    CASE WHEN GROUPING(bv.EmployeeID)=0 THEN MIN(bv.Title) ELSE NULL END AS f2,
    SUM(q1.f6) AS f6
FROM Employees bv
    INNER JOIN
        /* Country */
        (SELECT bv.CountryName AS f4,
            bv.CountryID AS f5_k0,
            bv.CountryID AS jk0
        FROM Country bv
        ) q0 ON bv.CountryID = q0.jk0
    LEFT OUTER JOIN
        /* Orders */
        (SELECT COUNT(1) AS f6,
            bv.EmployeeID AS jk0
        FROM Orders bv
        GROUP BY bv.EmployeeID
        ) q1 ON bv.EmployeeID = q1.jk0
GROUP BY q0.f5_k0, bv.EmployeeID WITH ROLLUP
ORDER BY f5_g, f5_k0, fpk_g, fpk_k0

```

Fig. 11E



XML Report Definition Table

```
<?xml version="1.0" encoding="utf-8" ?>
<reportDefinition baseViewID="Order" name="Report1" type="detail">
  <detailFields>
    <field id="3" ref="Order Date" />
    <field id="4" ref="Country">
      <relationPath relationID="Ship Country" />
    </field>
  </detailFields>
  <groupFields axis="1">
    <field id="2" type="rowRef">
      <relationPath relationID="Customer" />
      <detailFields>
        <field id="1" ref="Company Name" />
      </detailFields>
    </field>
  </groupFields>
  <measureFields>
    <field id="5" type="aggregate" ref="Orders" totalsOnly="true">
      <relationPath />
    </field>
  </measureFields>
  <reportOptions>
    <displayTotals hierarchyRows="true" />
  </reportOptions>
</reportDefinition>
```

Fig. 12A

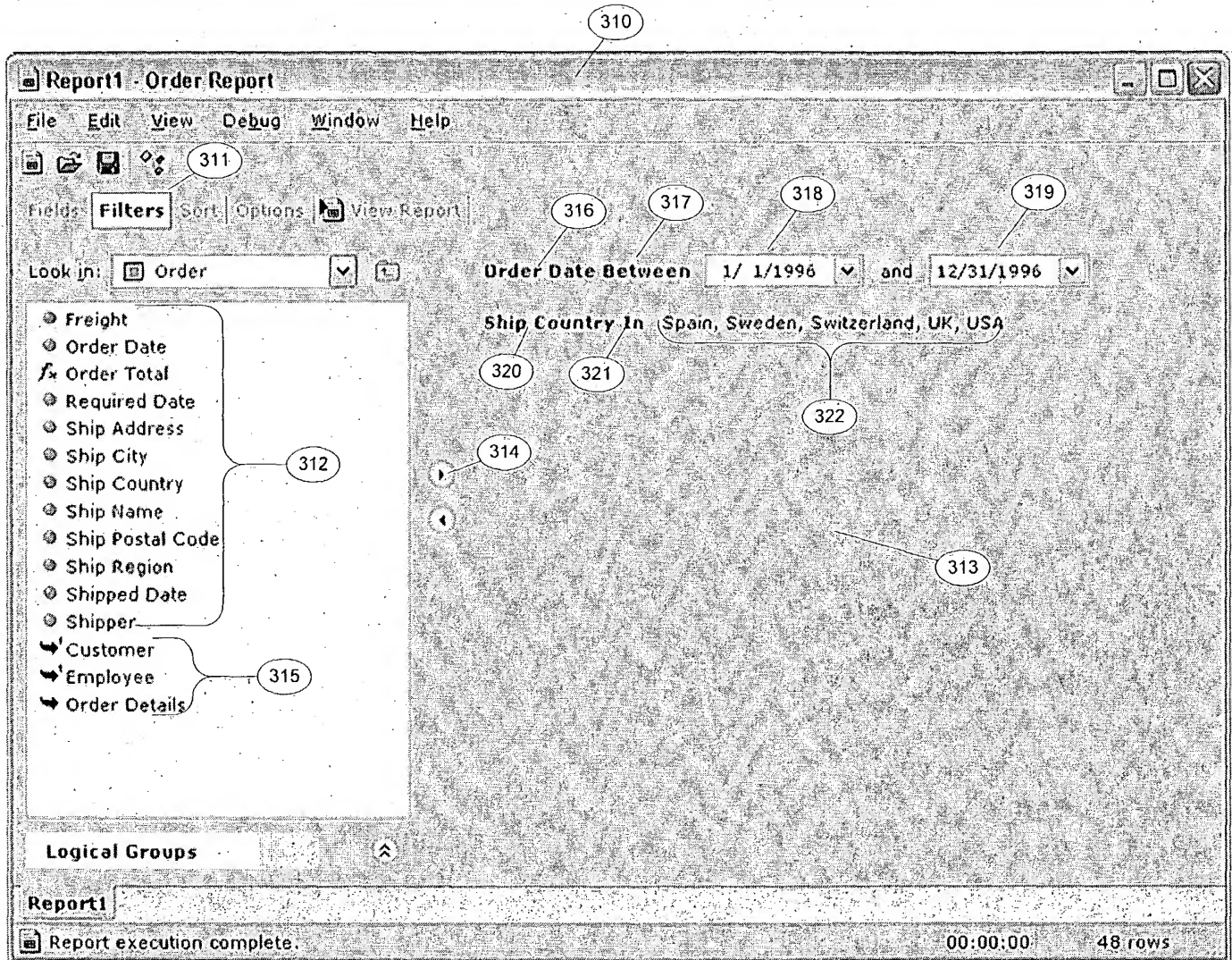


Fig. 12B

XML Report Definition Table

```

<?xml version="1.0" encoding="utf-8" ?>
<reportDefinition baseViewID="Order" name="Report1" type="detail">
  <detailFields>
    <field id="3" ref="Order Date" />
    <field id="4" ref="Country">
      <relationPath relationID="Ship Country" />
    </field>
  </detailFields>
  <groupFields axis="1">
    <field id="2" type="rowRef">
      <relationPath relationID="Customer" />
    <detailFields>
      <field id="1" ref="Company Name" />
    </detailFields>
  </field>
</groupFields>
  <measureFields>
    <field id="5" type="aggregate" ref="Orders" totalsOnly="true">
      <relationPath />
    </field>
  </measureFields>
  <filter type="primary">
    <field ref="Order Date">
      <filterValue operator="between">1/1/1996;12/31/1996</filterValue>
    </field>
    <field type="rowRef" showDeepSubfilterOption="true">
      <relationPath relationID="Ship Country" />
      <filterValue operator="in">
        <item key0="Spain" />
        <item key0="Sweden" />
        <item key0="Switzerland" />
        <item key0="UK" />
        <item key0="USA" />
      </filterValue>
    </field>
  </filter>
  <reportOptions>
    <displayTotals hierarchyRows="true" />
  </reportOptions>
</reportDefinition>

```

Fig. 12C

Report1 - Order Report

File Edit View Debug Window Help

Fields Filters Sort Options **View Report**

Filter On: Order Date Between 1/1/1996 and 12/31/1996, Ship Country In Spain, Sweden, Switzerland, UK, USA

Order Count: 48

Company Name	Order Date	Ship Country
Around the Horn	11/15/1996	UK
	12/16/1996	UK
Orders	2	
Berglunds snabbköp	8/12/1996	Sweden
	8/14/1996	Sweden
	12/16/1996	Sweden
Orders	3	
Bólido Comidas preparadas	10/10/1996	Spain
Orders	1	
B's Beverages	8/26/1996	UK
Orders	1	
Chop-suey Chinese	7/11/1996	Switzerland
	12/11/1996	Switzerland

Report1

Report execution complete. 00:00:00 48 rows

SQL Query Table

```

SELECT q0.f2_k0 AS f2_k0,
       GROUPING(q0.f2_k0) AS f2_g,
       bv.OrderID AS fpk_k0,
       GROUPING(bv.OrderID) AS fpk_g,
       CASE WHEN GROUPING(q0.f2_k0)=0 THEN MIN(q0.f1) ELSE NULL END AS f1,
       CASE WHEN GROUPING(bv.OrderID)=0 THEN MIN(bv.OrderDate) ELSE NULL END AS f3,
       CASE WHEN GROUPING(bv.OrderID)=0 THEN MIN(q1.f4) ELSE NULL END AS f4,
       COUNT(1) AS f5
FROM Orders bv
  INNER JOIN
  /* Customer */
  (SELECT bv.CompanyName AS f1,
         bv.CustomerID AS f2_k0,
         bv.CustomerID AS jk0
   FROM Customers bv
  ) q0 ON bv.CustomerID = q0.jk0
  INNER JOIN
  /* Ship Country */
  (SELECT bv.CountryName AS f4,
         bv.CountryID AS jk0
   FROM Country bv
  ) q1 ON bv.ShipCountryID = q1.jk0
WHERE (bv.OrderDate BETWEEN '1996-01-01T00:00:00' AND '1996-12-31T00:00:00' AND
       bv.ShipCountryID IN(20, 21, 22, 23, 24))
GROUP BY q0.f2_k0, bv.OrderID WITH ROLLUP
ORDER BY f2_g, f2_k0, fpk_g, fpk_k0

```

Fig. 12D

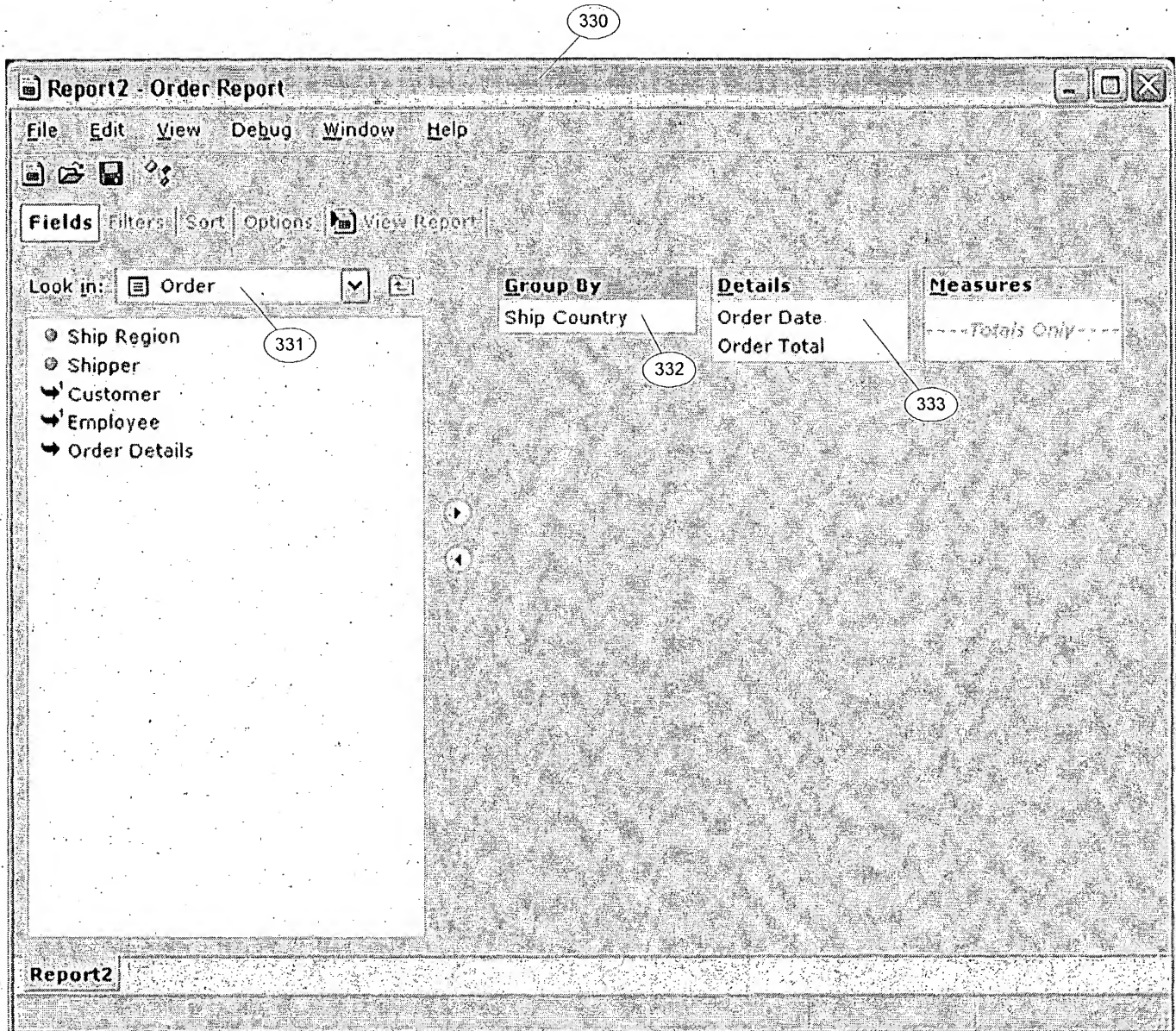


Fig. 13A

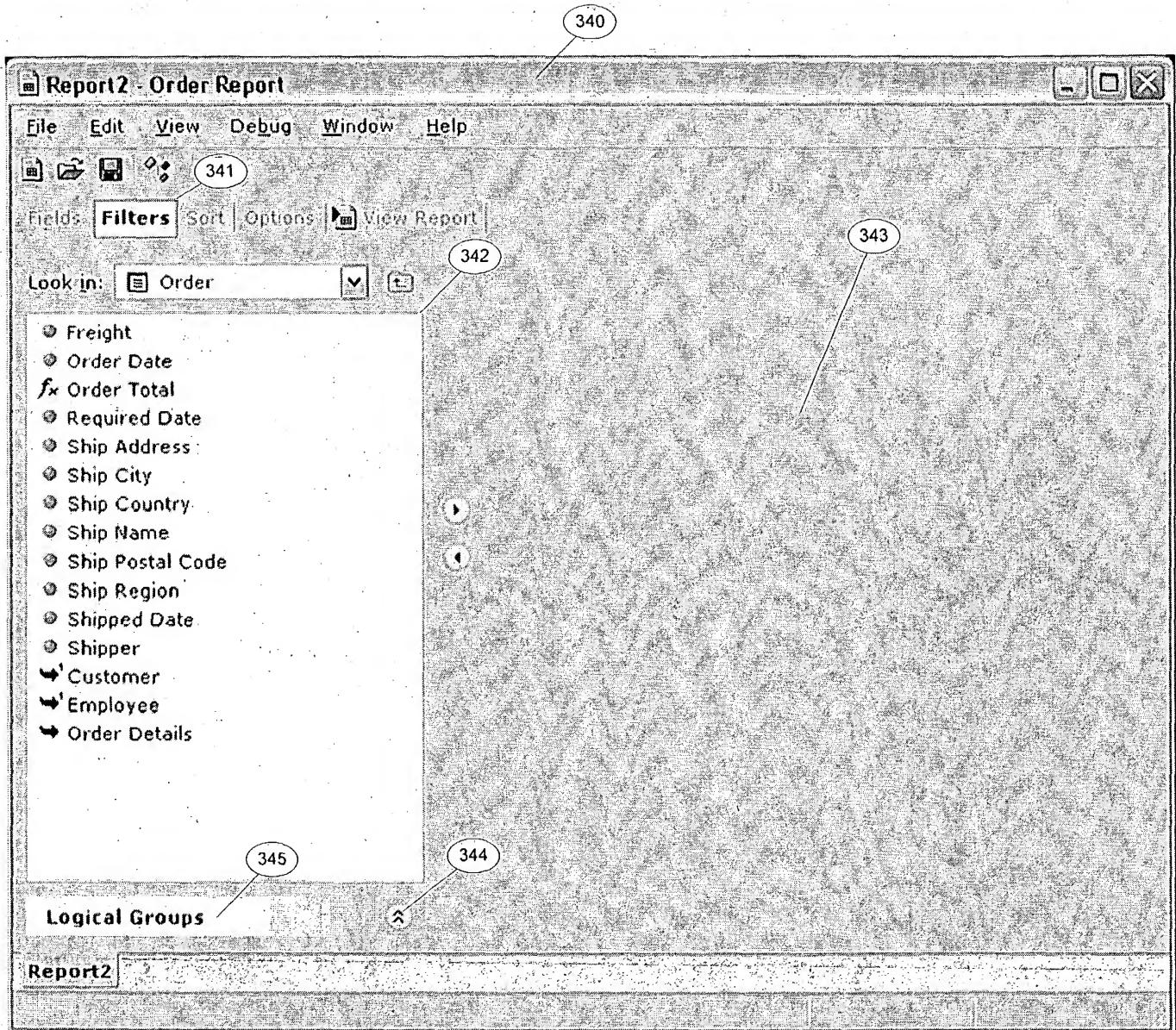


Fig. 13B

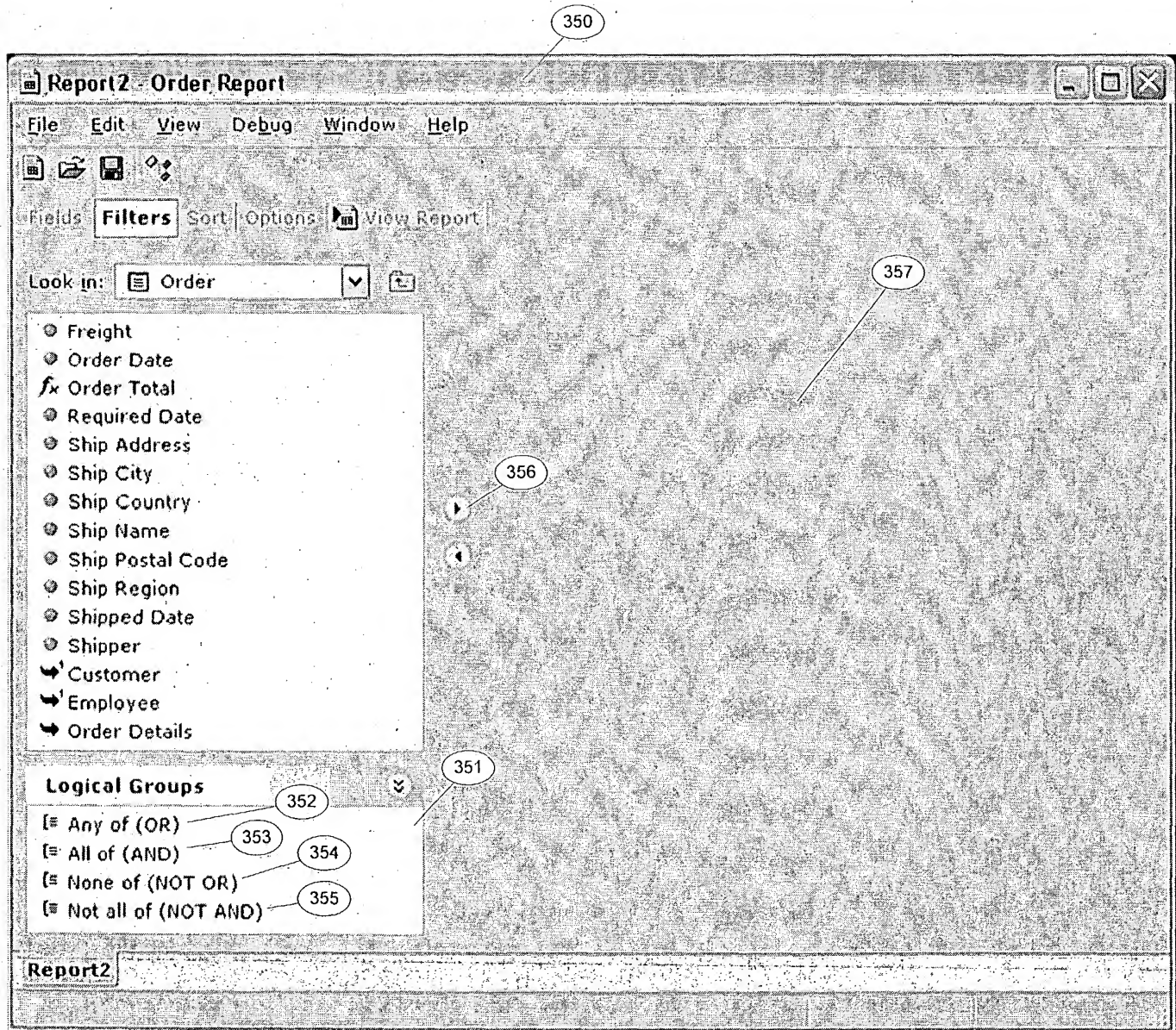


Fig. 13C

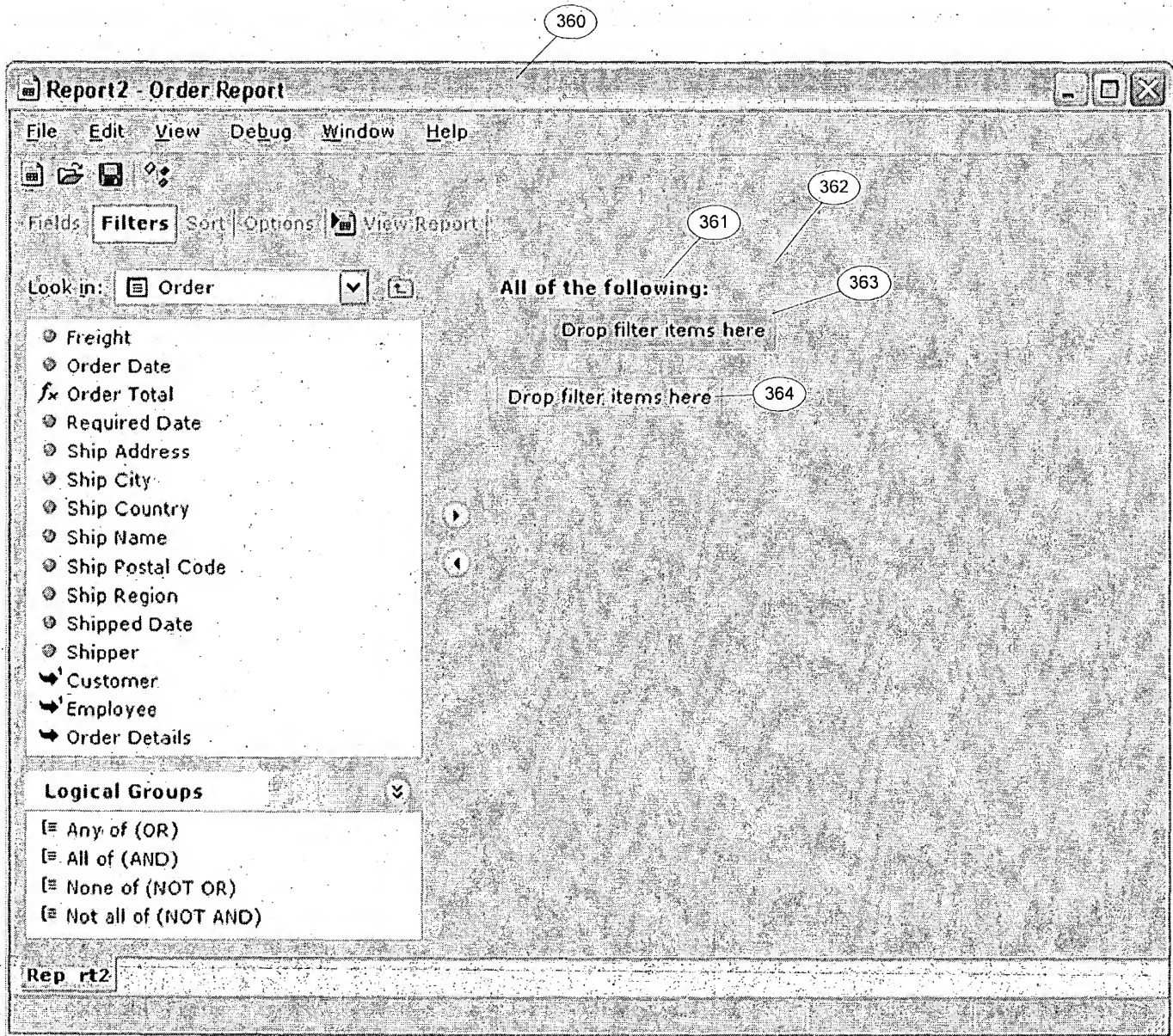


Fig. 13D

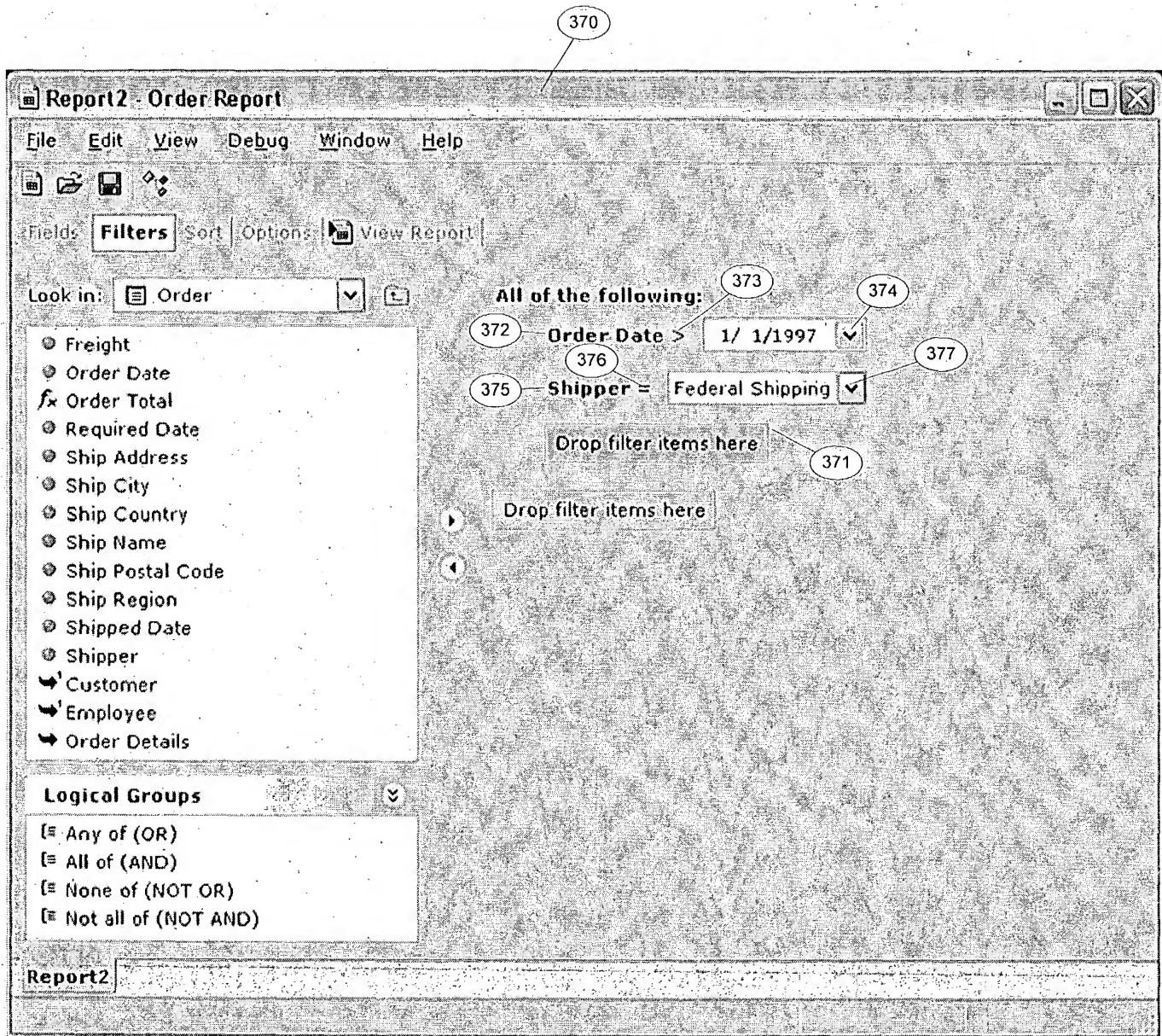


Fig. 13E

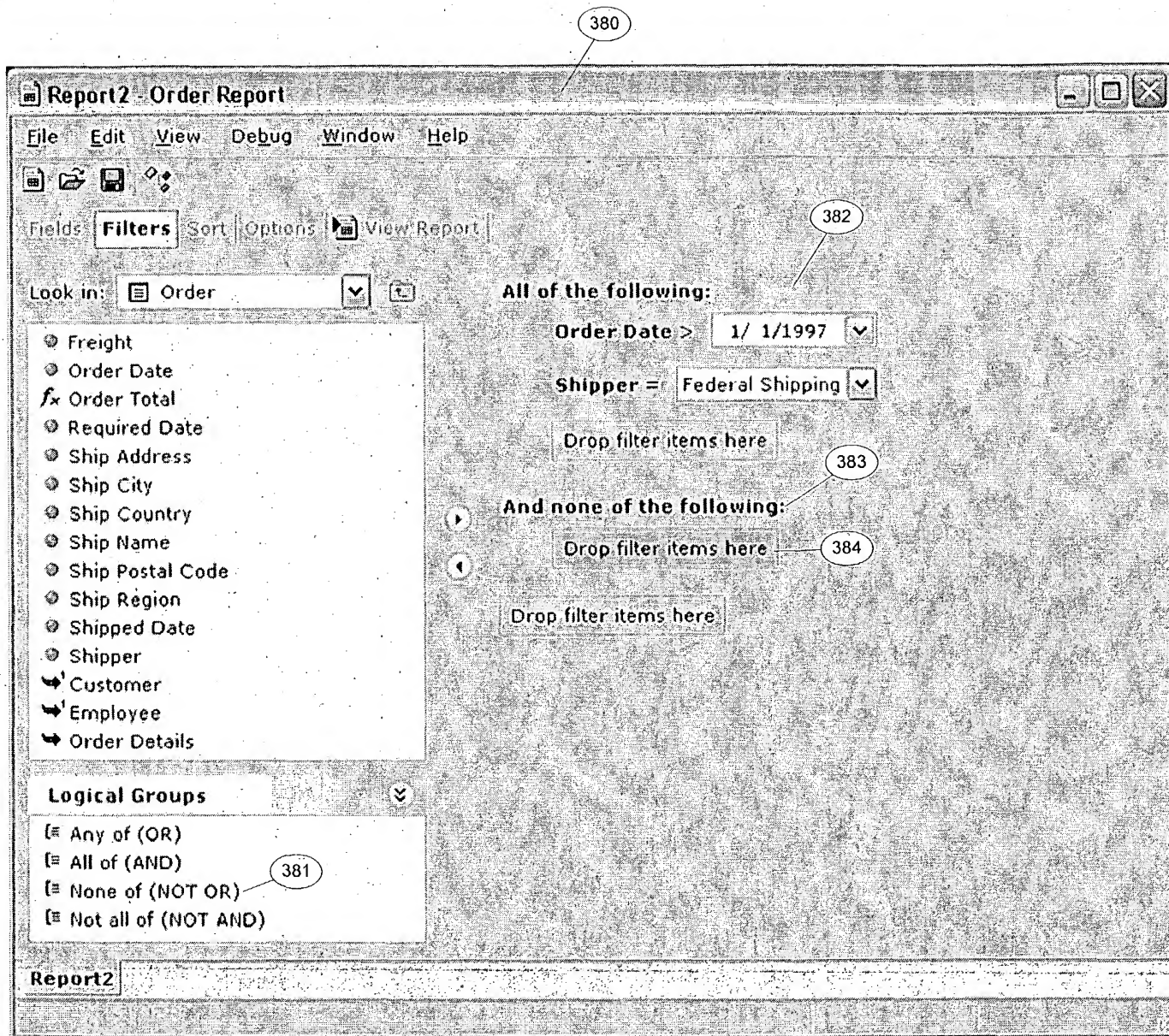


Fig. 13F

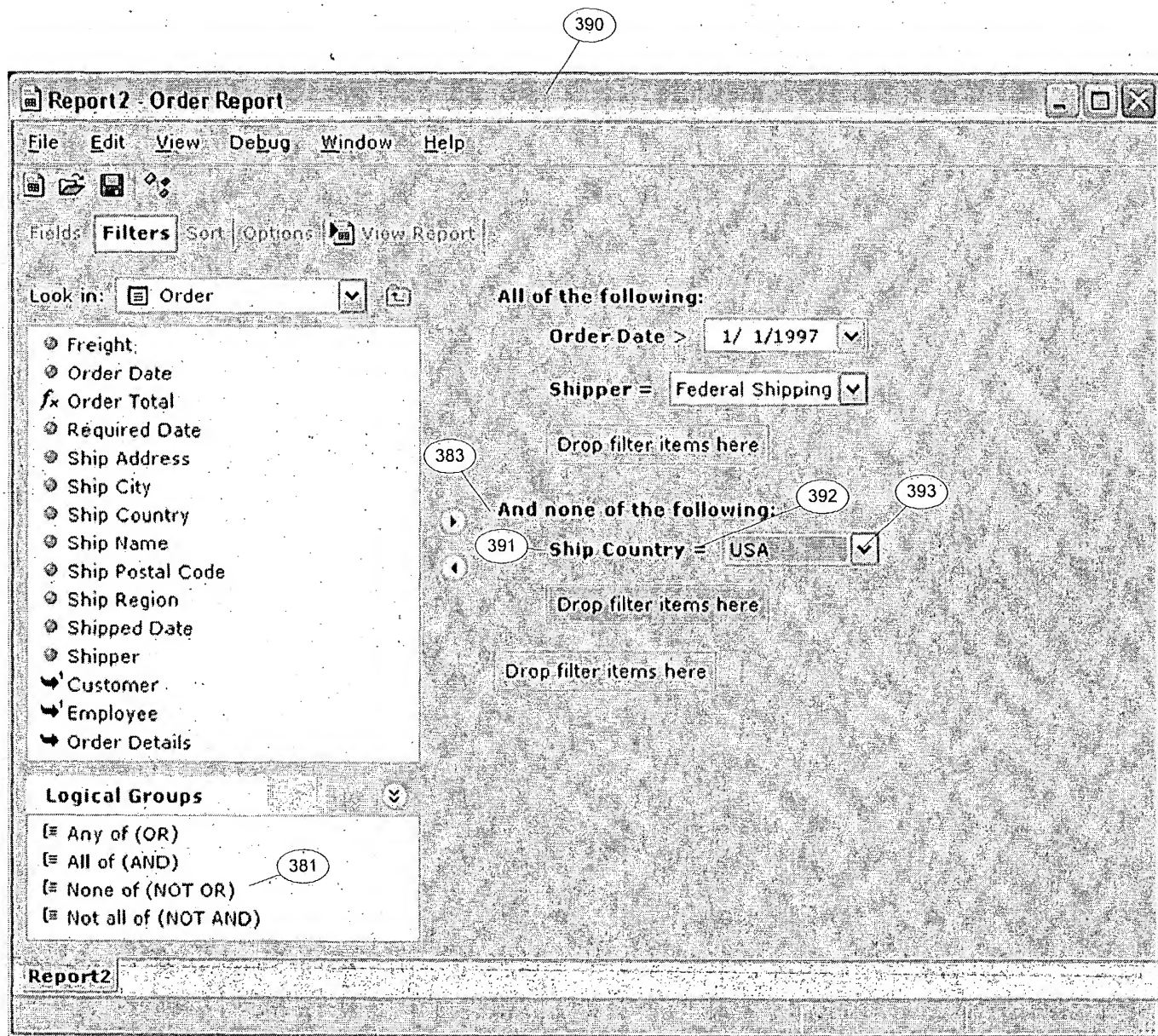


Fig. 13G

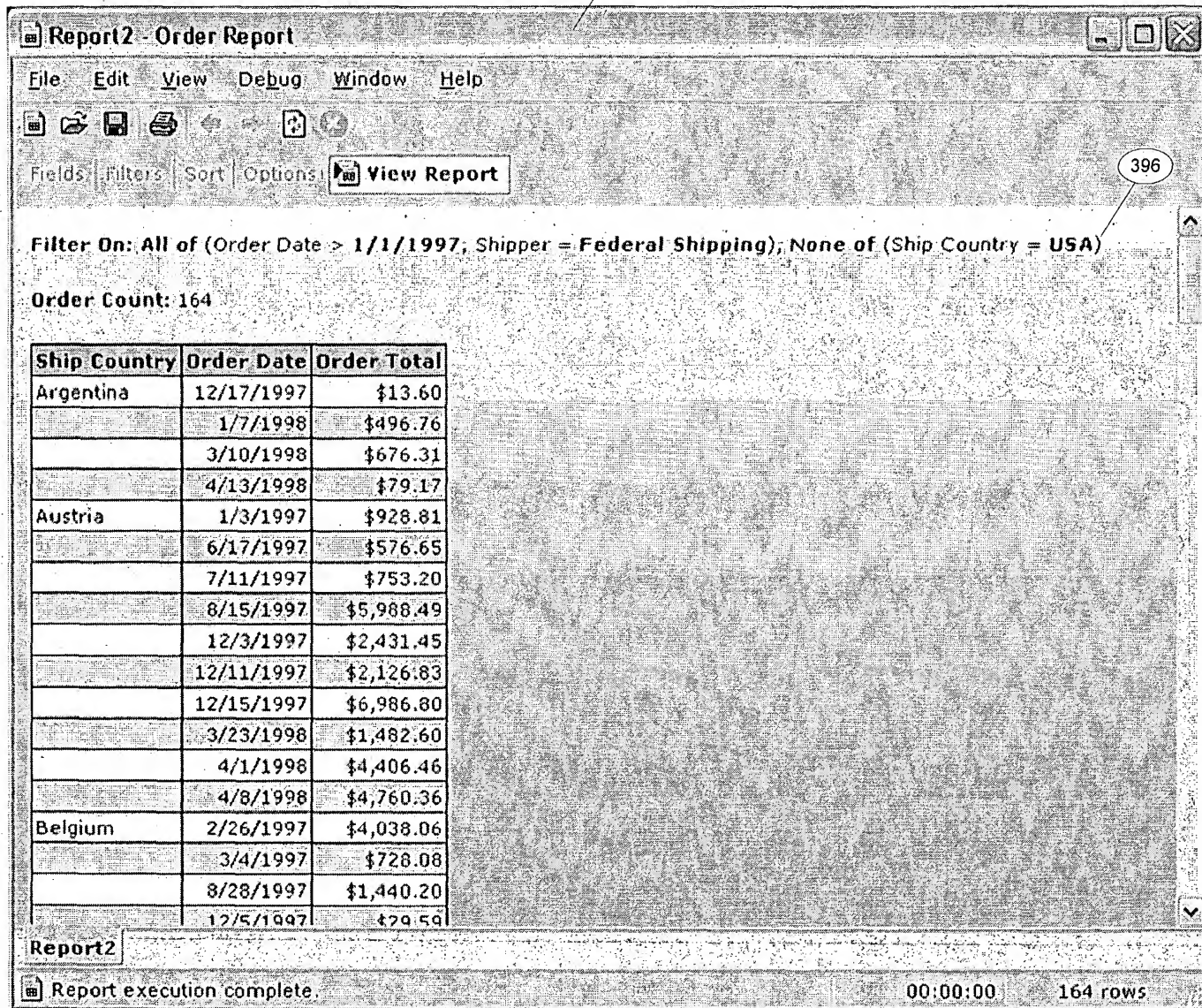


Fig. 13H

XML Report Definition Table

```
<?xml version="1.0" encoding="utf-8" ?>
<reportDefinition baseViewID="Order" name="Report2" type="detail">
  <detailFields>
    <field id="1" ref="Order Date" />
    <field id="2" type="expression" ref="Order Total" dataType="numeric" />
  </detailFields>
  <groupFields axis="1">
    <field id="4" type="rowRef">
      <relationPath relationID="Ship Country" />
      <detailFields>
        <field id="3" ref="Country" />
      </detailFields>
    </field>
  </groupFields>
  <filter type="primary">
    <filterGroup operator="and">
      <field ref="Order Date">
        <filterValue operator="greaterThan">1/1/1997</filterValue>
      </field>
      <field type="rowRef" showDeepSubfilterOption="true">
        <relationPath relationID="Shipper" />
        <filterValue operator="equals">
          <item key0="Federal Shipping" />
        </filterValue>
      </field>
    </filterGroup>
    <filterGroup operator="or" not="true">
      <field type="rowRef" showDeepSubfilterOption="true">
        <relationPath relationID="Ship Country" />
        <filterValue operator="equals">
          <item key0="USA" />
        </filterValue>
      </field>
    </filterGroup>
  </filter>
</reportDefinition>
```

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SQL Query Table

```
SELECT q0.f4_k0 AS f4_k0,
  GROUPING(q0.f4_k0) AS f4_g,
  bv.OrderID AS fpk_k0,
  GROUPING(bv.OrderID) AS fpk_g,
  CASE WHEN GROUPING(q0.f4_k0)=0 THEN MIN(q0.f3) ELSE NULL END AS f3,
  CASE WHEN GROUPING(bv.OrderID)=0 THEN MIN(bv.OrderDate) ELSE NULL END AS f1,
  CASE WHEN GROUPING(bv.OrderID)=0 THEN MIN(((q1.auto8) + (bv.Freight))) ELSE NULL
END AS f2
FROM Orders bv

  INNER JOIN
  /* Ship Country */
  (SELECT bv.CountryName AS f3,
    bv.CountryID AS f4_k0,
    bv.CountryID AS jk0
  FROM Country bv
  ) q0 ON bv.ShipCountryID = q0.jk0

  LEFT OUTER JOIN
  /* Order Details */
  (SELECT SUM(((bv.UnitPrice) * (bv.Quantity) * (1-(bv.Discount)))) AS auto8,
    bv.OrderID AS jk0
  FROM [Order Details] bv
  GROUP BY bv.OrderID
  ) q1 ON bv.OrderID = q1.jk0

WHERE ((bv.OrderDate > '1997-01-01T00:00:00' AND (bv.ShipVia =3)) AND (NOT
((bv.ShipCountryID =24))))
GROUP BY q0.f4_k0, bv.OrderID WITH ROLLUP
HAVING NOT(GROUPING(q0.f4_k0)=1 AND GROUPING(bv.OrderID)=1)
ORDER BY f4_g, f4_k0, fpk_g, fpk_k0
```

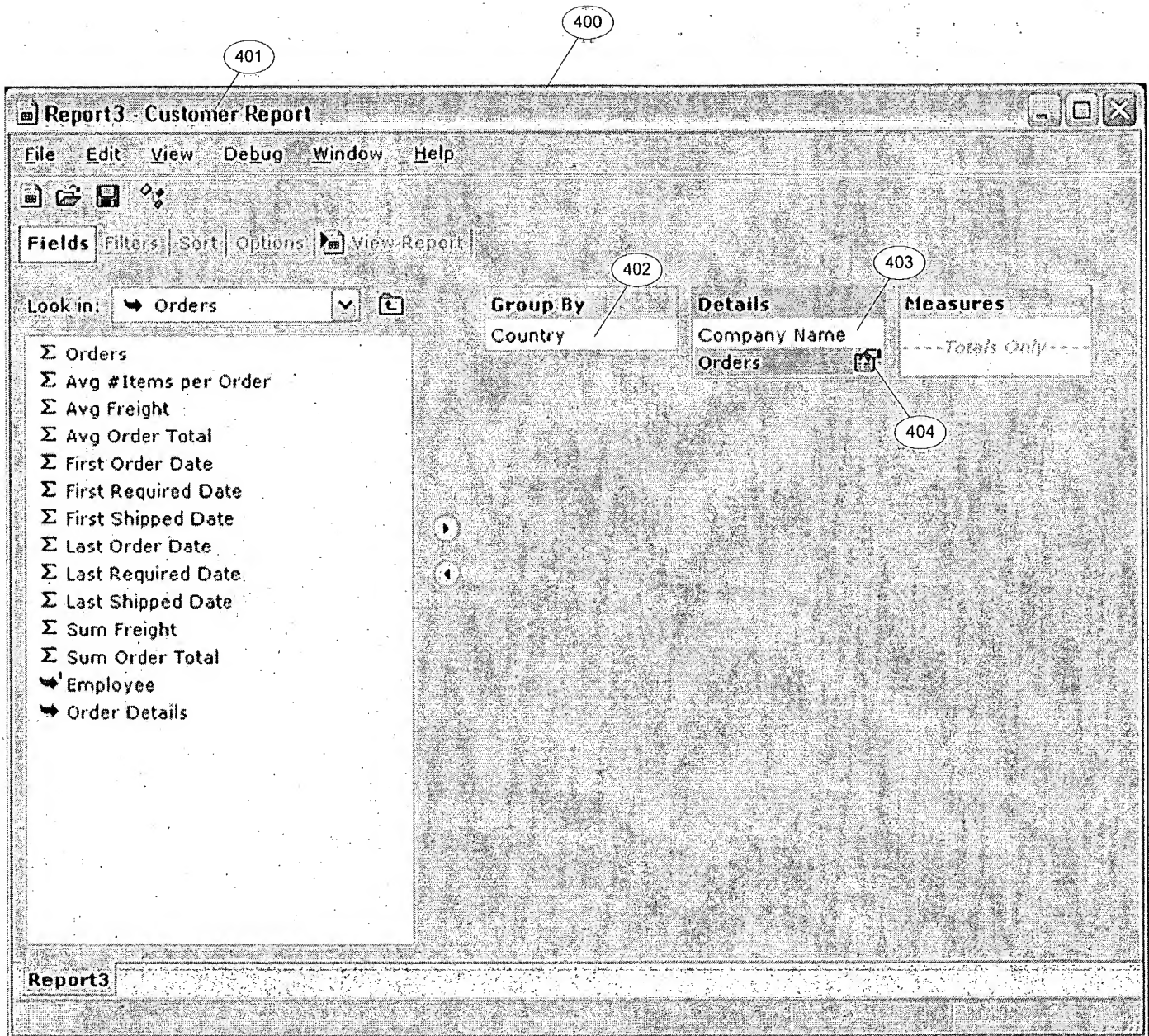


Fig. 14A

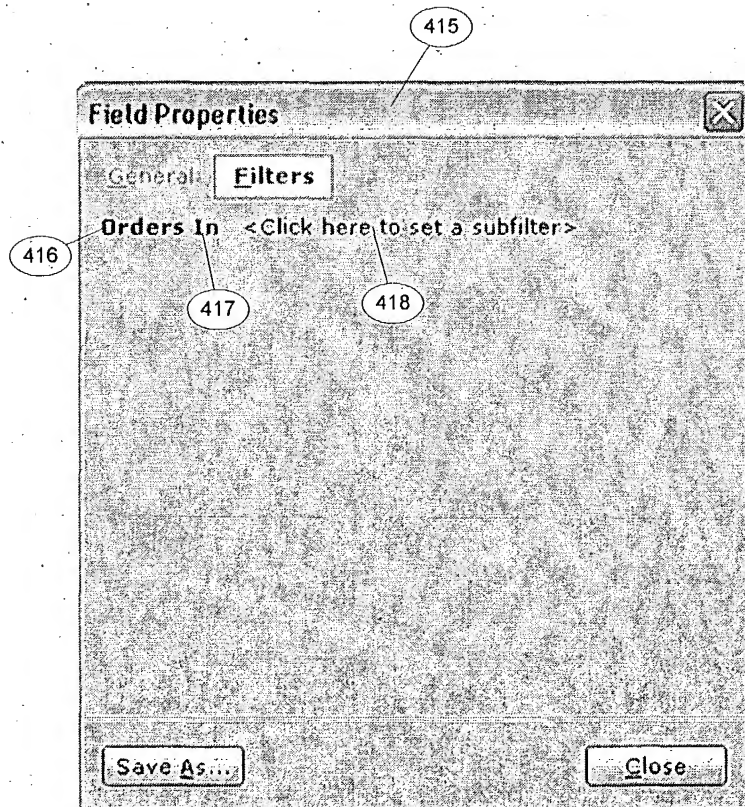
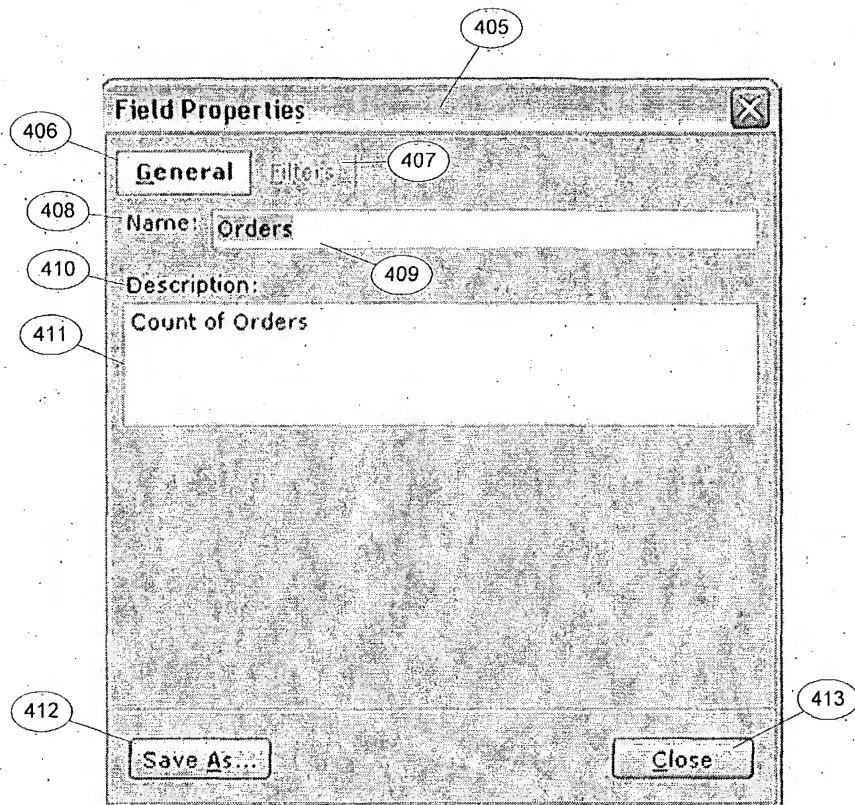


Fig. 14B

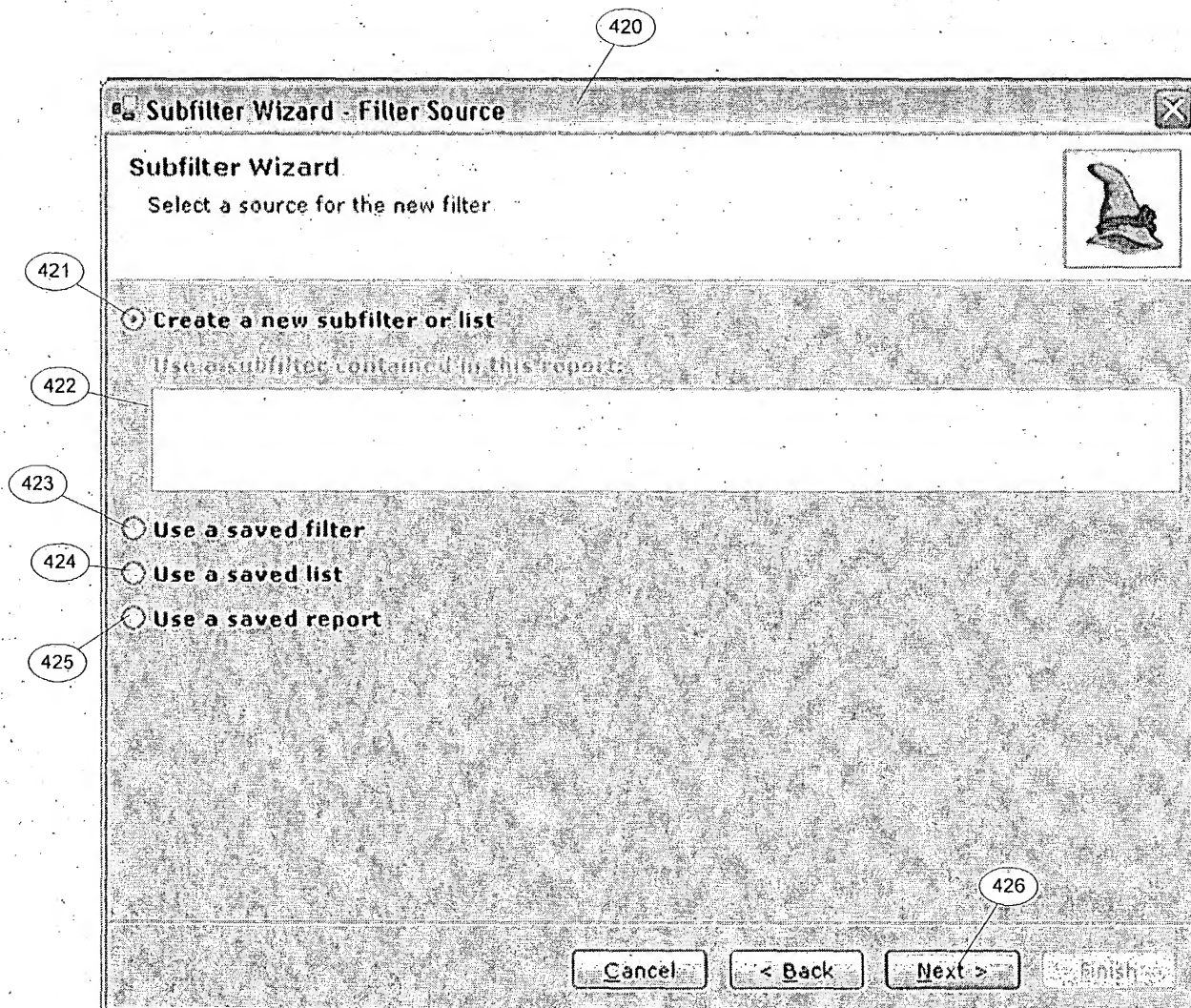


Fig. 14C

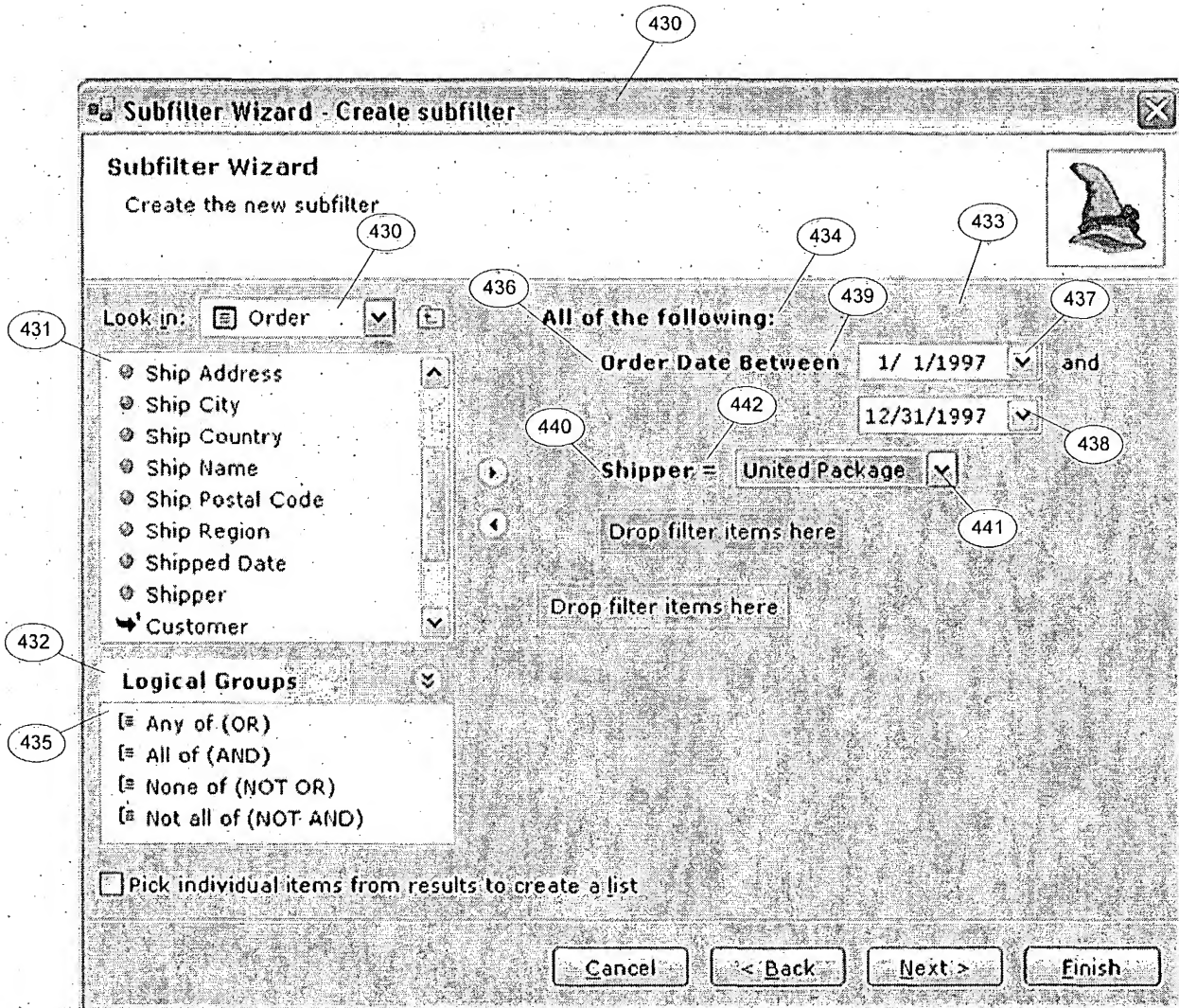


Fig. 14D

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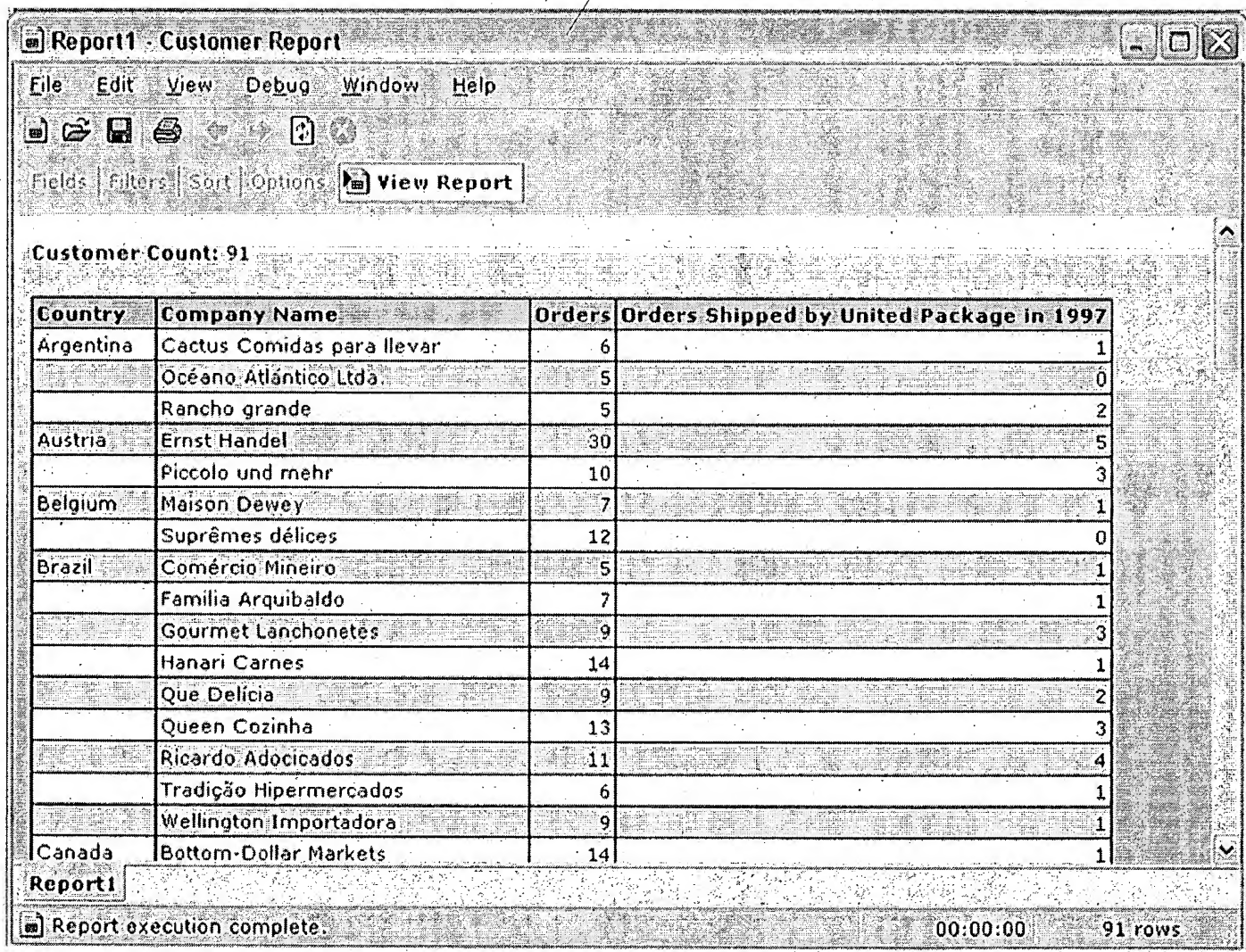


Fig. 14E

XML Report Definition Table

```
<?xml version="1.0" encoding="utf-8" ?>
<reportDefinition baseViewID="Customer" name="Report3" type="detail">
  <detailFields>
    <field id="3" ref="Company Name" />
    <field id="4" type="aggregate" ref="Orders">
      <relationPath relationID="Orders" />
    </field>
    <field id="5" name="Orders Shipped by United Package in 1997" type="aggregate"
allowAsGroupField="true" defaultSortDesc="true" alignment="right" function="count">
      <relationPath relationID="Orders" filter="1" />
    </field>
  </detailFields>
  <groupFields axis="1">
    <field id="2" type="rowRef">
      <relationPath relationID="Country" />
      <detailFields>
        <field id="1" ref="Country" />
      </detailFields>
    </field>
  </groupFields>
  <filter id="1" baseViewID="Order">
    <filterGroup operator="and">
      <field ref="Order Date">
        <filterValue operator="between">1/1/1997;12/31/1997</filterValue>
      </field>
      <field type="rowRef" showDeepSubfilterOption="true">
        <relationPath relationID="Shipper" />
        <filterValue operator="equals">
          <item key0="2" />
        </filterValue>
      </field>
    </filterGroup>
  </filter>
</reportDefinition>
```

Fig. 14F

SQL Query Table

```

SELECT q0.f2_k0 AS f2_k0,
       GROUPING(q0.f2_k0) AS f2_g,
       bv.CustomerID AS fpk_k0,
       GROUPING(bv.CustomerID) AS fpk_g,
       CASE WHEN GROUPING(q0.f2_k0)=0 THEN MIN(q0.f1) ELSE NULL END AS f1,
       CASE WHEN GROUPING(bv.CustomerID)=0 THEN MIN(bv.CompanyName) ELSE NULL END AS f3,
       CASE WHEN GROUPING(bv.CustomerID)=0 THEN MIN(q1.f4) ELSE NULL END AS f4,
       CASE WHEN GROUPING(bv.CustomerID)=0 THEN MIN(q2.f5) ELSE NULL END AS f5
FROM Customers bv

    INNER JOIN
    /* Country */
    (SELECT bv.CountryName AS f1,
         bv.CountryID AS f2_k0,
         bv.CountryID AS jk0
    FROM Country bv
    ) q0 ON bv.CountryID = q0.jk0

    LEFT OUTER JOIN
    /* Orders */
    (SELECT COUNT(1) AS f4,
         bv.CustomerID AS jk0
    FROM Orders bv
    GROUP BY bv.CustomerID
    ) q1 ON bv.CustomerID = q1.jk0

    LEFT OUTER JOIN
    /* Orders<filter:1> */
    (SELECT COUNT(1) AS f5,
         bv.CustomerID AS jk0
    FROM Orders bv
    WHERE ((bv.OrderDate BETWEEN '1997-01-01T00:00:00' AND '1997-12-31T00:00:00' AND
    (bv.ShipVia =2)))
    GROUP BY bv.CustomerID
    ) q2 ON bv.CustomerID = q2.jk0

GROUP BY q0.f2_k0, bv.CustomerID WITH ROLLUP
HAVING NOT (GROUPING(q0.f2_k0)=1 AND GROUPING(bv.CustomerID)=1)
ORDER BY f2_g, f2_k0, fpk_g, fpk_k0

```

Fig. 14G

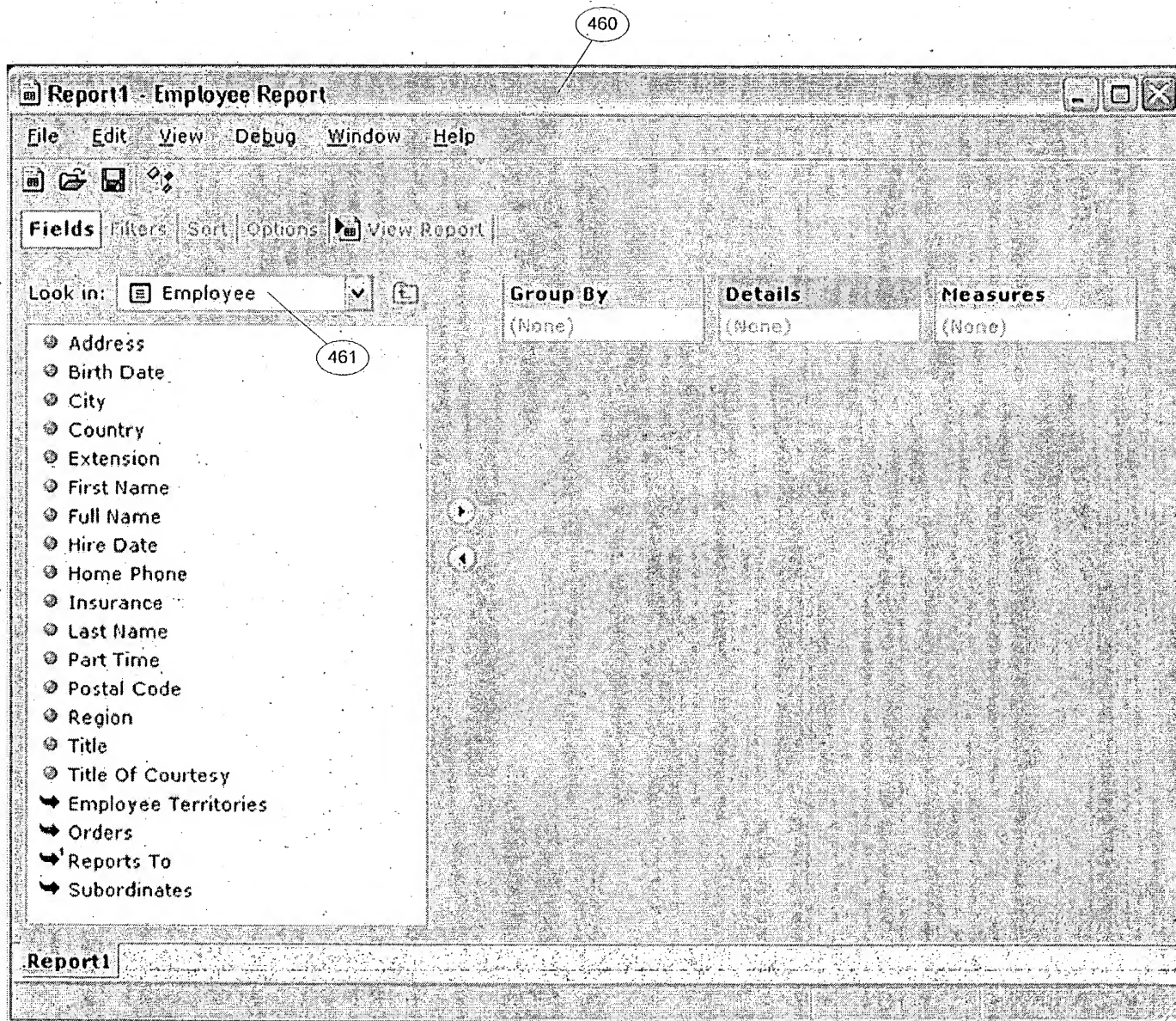


Fig. 15A

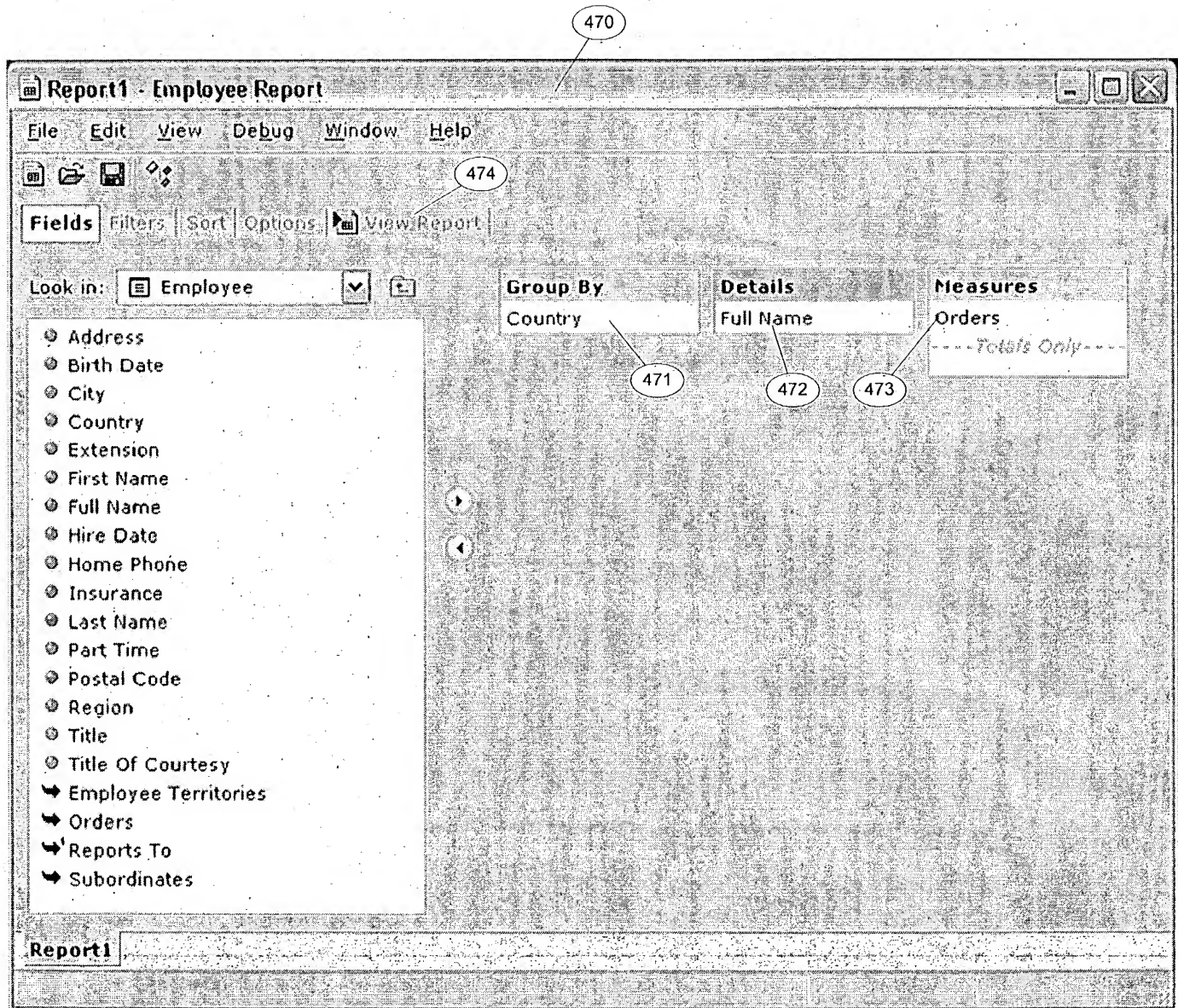


Fig. 15B

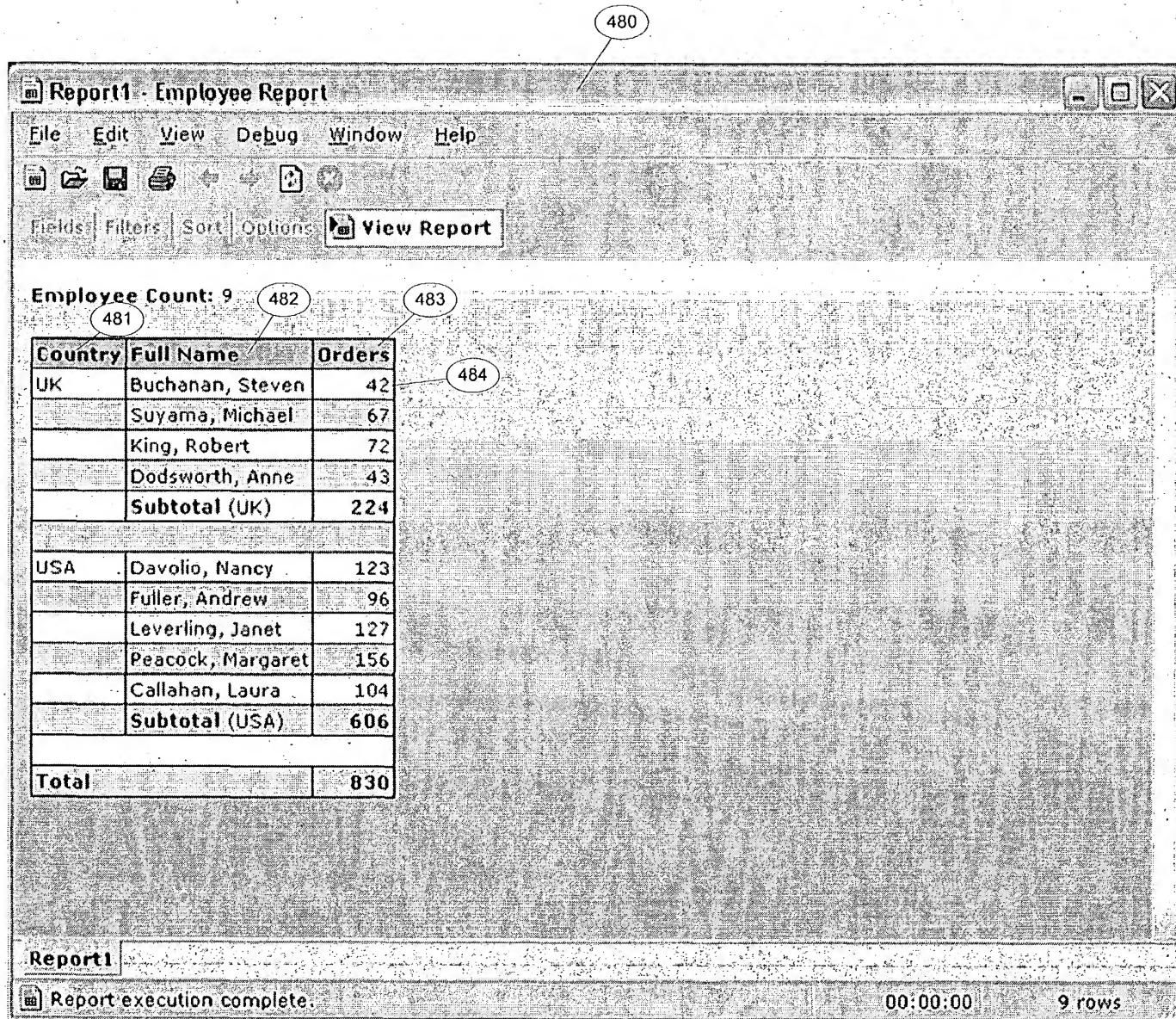


Fig. 15C

Report1 - Employee Report					
File Edit View Debug Window Help					
Fields Filters Sort Options View Report					
Filter On: Employee In Buchanan, Steven					
Order Count: 42					
Company Name	Order Date	Shipped Date	Freight	Order Details	Ship Address
Berglunds snabbköp	9/2/1997	9/11/1997	\$55.26	3	Berguvsvägen 8
Berglunds snabbköp	2/3/1998	2/12/1998	\$109.11	3	Berguvsvägen 8
Blondesddsl père et fils	9/4/1996	9/10/1996	\$5.74	2	24, place Kléber
Bon app'	11/5/1997	11/14/1997	\$20.12	3	12, rue des Bouchers
Chop-suey Chinese	7/11/1996	7/23/1996	\$22.98	3	Hauptstr. 31
Familia Arquibaldo	8/29/1997	9/3/1997	\$176.81	3	Rua Orós, 92
Folk och få HB	12/10/1996	12/19/1996	\$5.44	1	Åkergatan 24
Frankenversand	9/19/1997	9/23/1997	\$31.85	3	Berliner Platz 43
Godós Cocina típica	2/5/1998	2/9/1998	\$175.32	4	C/ Romero, 33
Godós Cocina típica	2/6/1998	2/11/1998	\$19.58	1	C/ Romero, 33
Hanari Carnes	3/3/1998	3/5/1998	\$62.74	2	Rua do Paço, 67
La maison d'Asie	11/20/1996	11/27/1996	\$19.64	3	1 rue Alsace-Lorraine
LILA-Supermercado	1/9/1998	1/13/1998	\$163.97	4	Carrera 52 con Ave. Bolívar #65-98 Llano I
LILA-Supermercado	2/20/1998	2/26/1998	\$1.21	1	Carrera 52 con Ave. Bolívar #65-98 Llano I
LILA-Supermercado	2/27/1998	2/28/1998	\$27.84	4	Ave. 5 de Mayo con Blvd....
Report1 Order					
Report execution complete.				00:00:00	42 rows

Fig. 15D

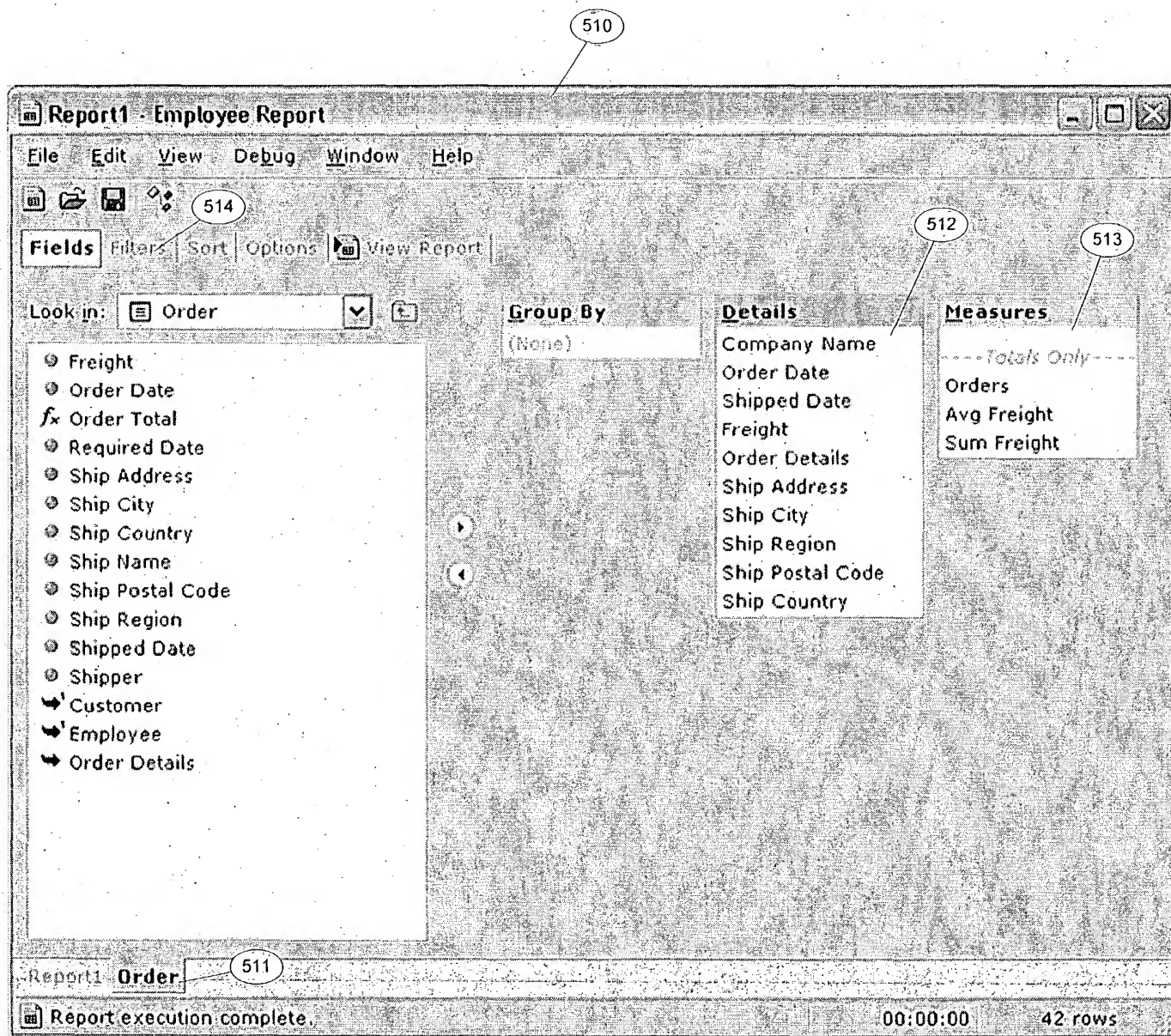


Fig. 15E

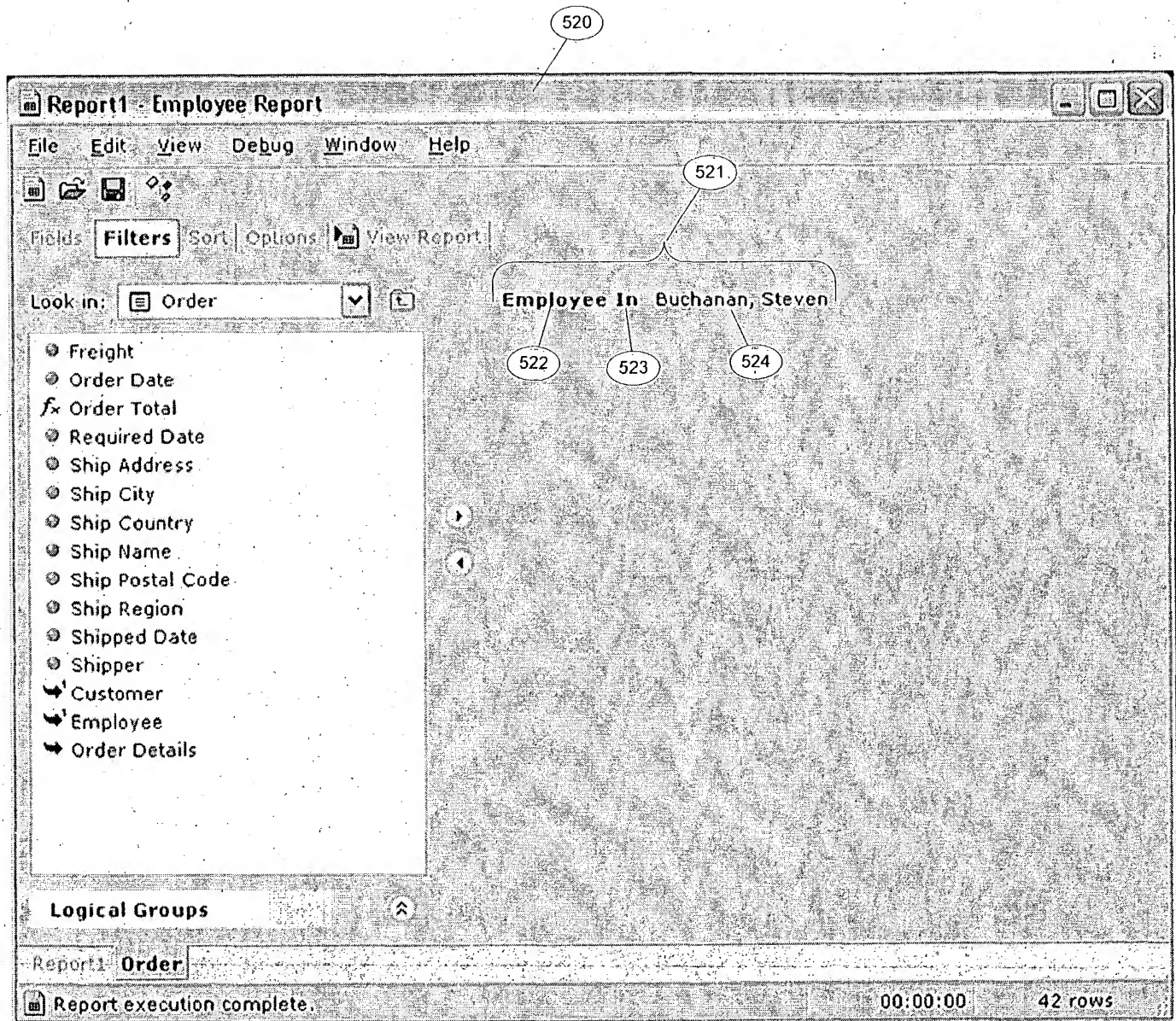


Fig. 15F

XML Report Definition Table

```
<?xml version="1.0" encoding="utf-8" ?>
<reportDefinition baseViewID="Order" name="Order" type="detail">
  <detailFields>
    <field id="1" ref="Company Name">
      <relationPath relationID="Country" />
    </field>
    <field id="2" ref="Order Date" />
    <field id="10" ref="Shipped Date" />
    <field id="11" ref="Freight" />
    <field id="12" type="aggregate" ref="Order Details">
      <relationPath relationID="Order Details" />
    </field>
    <field id="3" ref="Ship Address" />
    <field id="4" ref="Ship City" />
    <field id="7" ref="Ship Region" />
    <field id="8" ref="Ship Postal Code" />
    <field id="5" ref="Country">
      <relationPath relationID="Ship Country" />
    </field>
  </detailFields>
  <measureFields>
    <field id="13" type="aggregate" ref="Orders" totalsOnly="true">
      <relationPath />
    </field>
    <field id="14" type="aggregate" ref="Avg Freight" totalsOnly="true">
      <relationPath />
    </field>
    <field id="15" type="aggregate" ref="Sum Freight" totalsOnly="true">
      <relationPath />
    </field>
  </measureFields>
  <sortFields>
    <field fieldID="1" sortDesc="false" />
  </sortFields>
  <filter type="primary">
    <field type="deepSubfilter" filter="1">
      <relationPath relationID="Employee" />
    </field>
  </filter>
  <filter id="1" baseViewID="Employee">
    <field type="rowRef">
      <filterValue operator="in">
        <item key0="5" />
      </filterValue>
    </field>
  </filter>
  <reportOptions>
    <displayTotals />
  </reportOptions>
</reportDefinition>
```

Fig. 15G

SQL Query Table

```

SELECT q0.f4_k0 AS f4_k0,
       GROUPING(q0.f4_k0) AS f4_g,
       bv.OrderID AS fpk_k0,
       GROUPING(bv.OrderID) AS fpk_g,
       CASE WHEN GROUPING(q0.f4_k0)=0 THEN MIN(q0.f3) ELSE NULL END AS f3,
       CASE WHEN GROUPING(bv.OrderID)=0 THEN MIN(bv.OrderDate) ELSE NULL END AS f1,
       CASE WHEN GROUPING(bv.OrderID)=0 THEN MIN(((q1.auto8) + (bv.Freight))) ELSE NULL
END AS f2
FROM Orders bv
  INNER JOIN
  /* Ship Country */
  (SELECT bv.CountryName AS f3,
         bv.CountryID AS f4_k0,
         bv.CountryID AS jk0
   FROM Country bv
  ) q0 ON bv.ShipCountryID = q0.jk0
  LEFT OUTER JOIN
  /* Order Details */
  (SELECT SUM(((bv.UnitPrice) * (bv.Quantity) * (1-(bv.Discount)))) AS auto8,
         bv.OrderID AS jk0
   FROM [Order Details].bv
  GROUP BY bv.OrderID
  ) q1 ON bv.OrderID = q1.jk0
WHERE ((bv.OrderDate > '1997-01-01T00:00:00' AND (bv.ShipVia =3)) AND (NOT
((bv.ShipCountryID =24))))
GROUP BY q0.f4_k0, bv.OrderID WITH ROLLUP
HAVING NOT(GROUPING(q0.f4_k0)=1 AND GROUPING(bv.OrderID)=1)
ORDER BY f4_g, f4_k0, fpk_g, fpk_k0

```

Fig. 15H

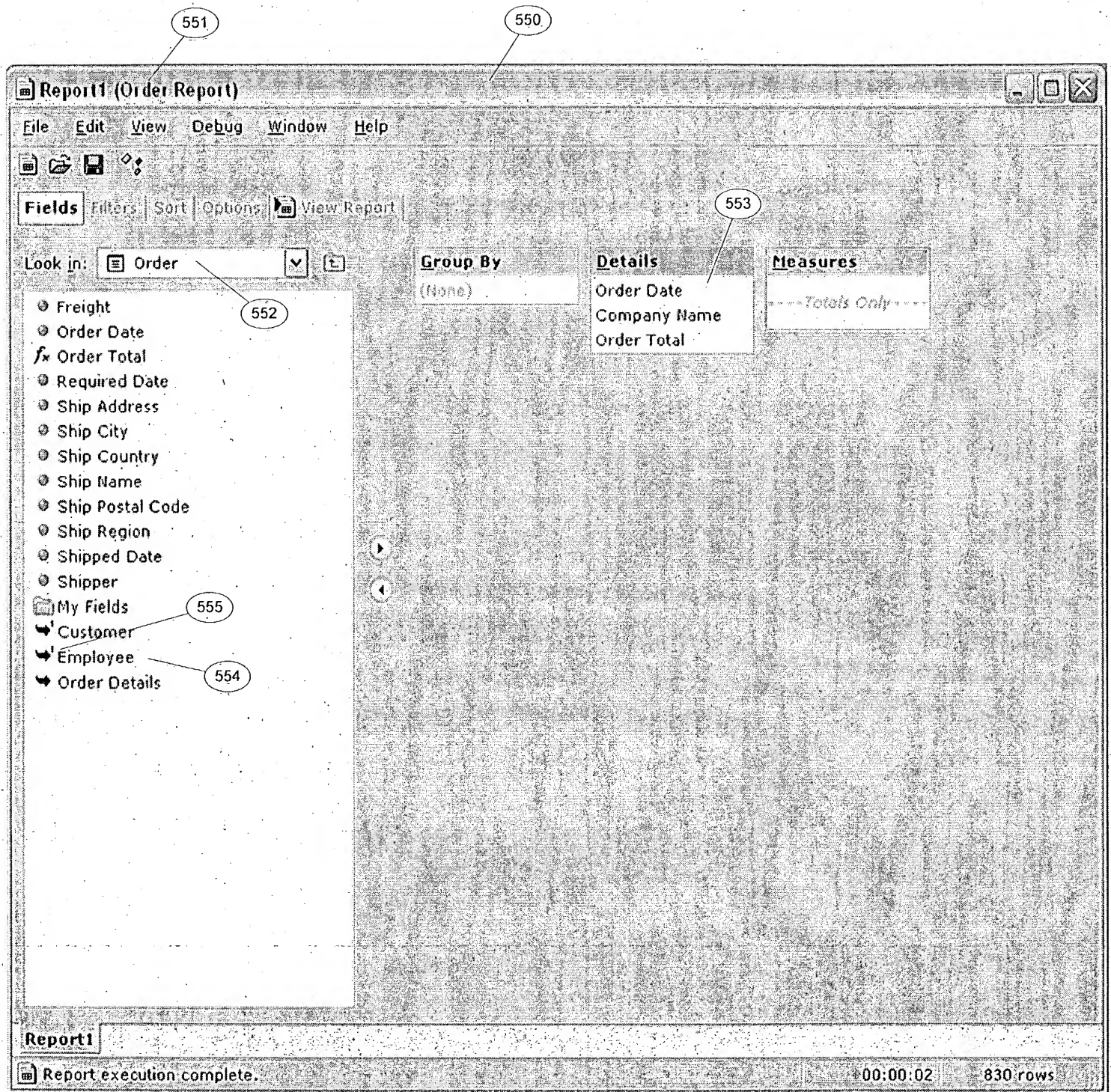


Fig. 16A

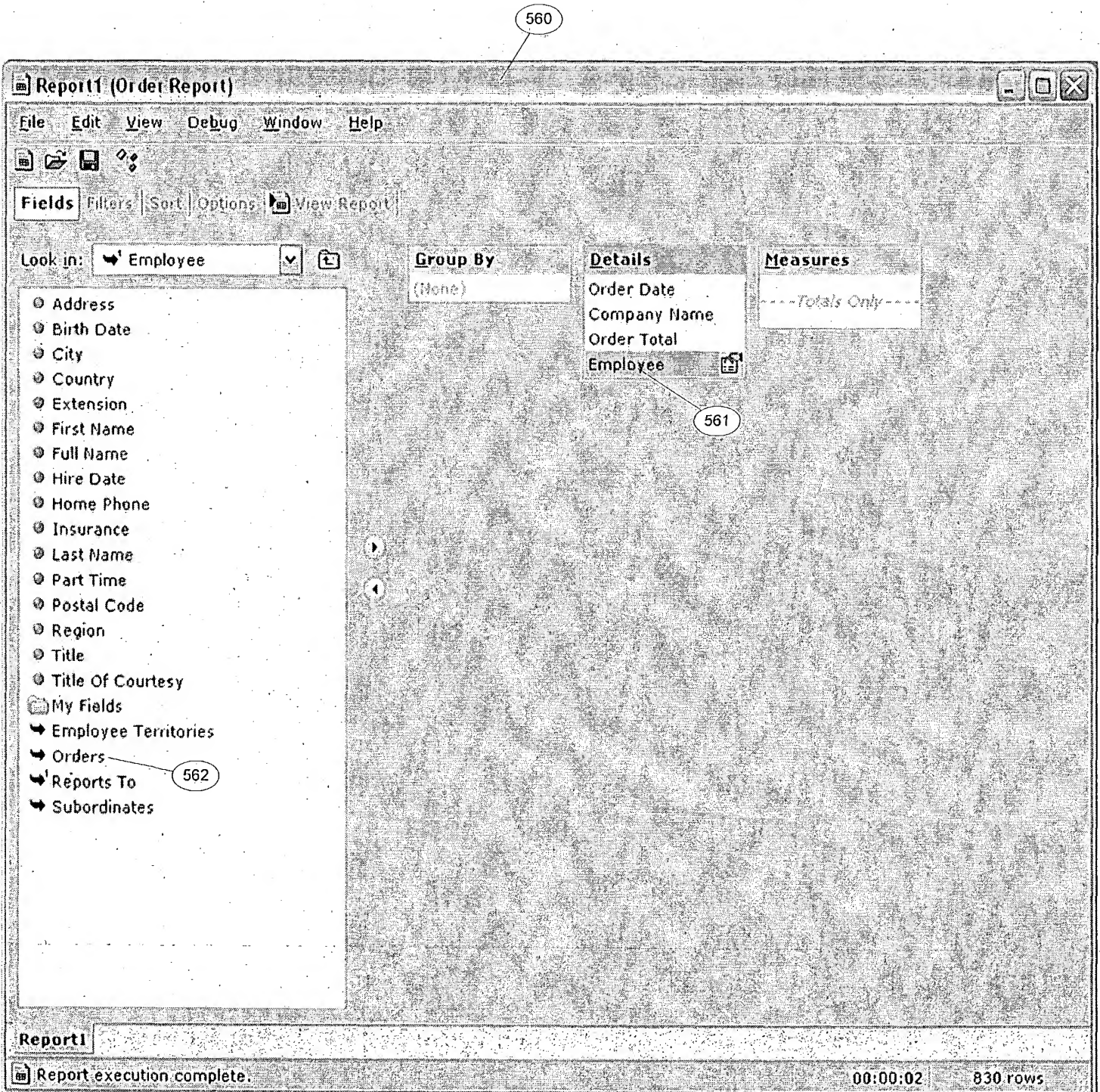


Fig. 16B

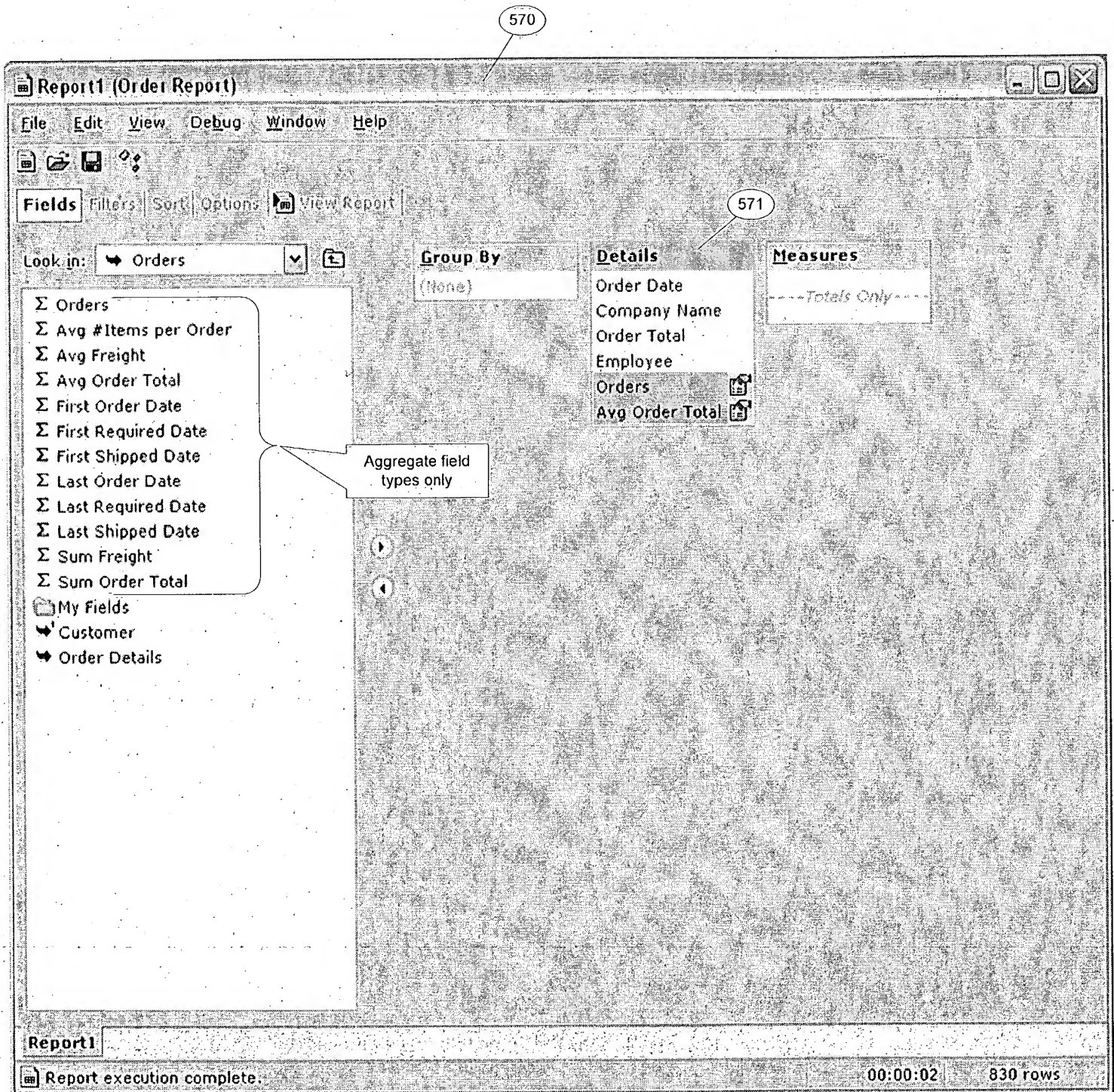


Fig. 16C

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Report1 (Order Report)					
File Edit View Debug Window Help					
Fields Filters Sort Options View Report					
Order Count: 830					
Order Date	Company Name	Order Total	Employee	Orders	Avg Order Total
1996.07.04	Vins et alcools Chevalier	\$472.38	Buchanan, Steven	42	\$1,731.21
1996.07.05	Toms Spezialitäten	\$1,875.01	Suyama, Michael	67	\$1,159.61
1996.07.08	Hanari Carnes	\$1,618.43	Peacock, Margaret	156	\$1,565.62
1996.07.08	Victuailles en stock	\$695.40	Leverling, Janet	127	\$1,682.66
1996.07.09	Suprêmes délices	\$3,649.20	Peacock, Margaret	156	\$1,565.62
1996.07.10	Hanari Carnes	\$1,502.97	Leverling, Janet	127	\$1,682.66
1996.07.11	Chop-suey Chinese	\$579.60	Buchanan, Steven	42	\$1,731.21
1996.07.12	Richter Supermarkt	\$2,638.83	Dodsworth, Anne	43	\$1,875.22
1996.07.15	Wellington Importadora	\$531.77	Leverling, Janet	127	\$1,682.66
1996.07.16	HILARION-Abastos	\$1,201.81	Peacock, Margaret	156	\$1,565.62
1996.07.17	Ernst Handel	\$1,755.39	Davolio, Nancy	123	\$1,633.69
1996.07.18	Centro comercial Moctezuma	\$104.05	Peacock, Margaret	156	\$1,565.62
1996.07.19	Ottilies Käseladen	\$1,559.74	Peacock, Margaret	156	\$1,565.62
1996.07.19	Que Delicia	\$451.05	Peacock, Margaret	156	\$1,565.62
1996.07.22	Rattlesnake Canyon Grocery	\$632.29	Callahan, Laura	104	\$1,291.83
1996.07.23	Ernst Handel	\$2,019.86	Dodsworth, Anne	43	\$1,875.22
1996.07.24	Folk och få HB	\$699.30	Suyama, Michael	67	\$1,159.61
1996.07.25	Blondesdsi père et fils	\$1,231.28	Fuller, Andrew	96	\$1,825.36
1996.07.26	Wartian Herkku	\$372.29	Leverling, Janet	127	\$1,682.66
1996.07.29	Frankenversand	\$3,745.18	Peacock, Margaret	156	\$1,565.62
1996.07.30	GROSELLA-Restaurante	\$1,167.49	Callahan, Laura	104	\$1,291.83
1996.07.31	White Clover Markets	\$646.76	Buchanan, Steven	42	\$1,731.21
1996.08.01	Wartian Herkku	\$1,512.54	Davolio, Nancy	123	\$1,633.69
1996.08.01	Split Rail Beer & Ale	\$52.54	Suyama, Michael	67	\$1,159.61
1996.08.02	Rattlesnake Canyon Grocery	\$1,554.03	Suyama, Michael	67	\$1,159.61
1996.08.05	QUICK-Stop	\$2,113.35	Leverling, Janet	127	\$1,682.66
Report1					
Report execution complete:				00:00:02	830 rows

Fig. 16D

XML Report Definition Table

```
<?xml version="1.0" encoding="utf-8" ?>
<reportDefinition baseViewID="Order" name="Report1" type="detail">
  <detailFields>
    <field id="1" ref="Order\Order Date" />
    <field id="2" ref="Customer\Company Name">
      <relationPath relationID="Order\Customer" />
    </field>
    <field id="3" type="expression" ref="Order\Order Total" dataType="numeric" />
    <field id="4" ref="Employee\Full Name">
      <relationPath relationID="Order\Employee" />
    </field>
    <field id="5" type="aggregate" ref="Order\Orders">
      <relationPath relationID="Order\Employee" />
      <relationPath relationID="Employee\Orders" />
    </field>
    <field id="6" type="aggregate" ref="Order\Avg Order Total">
      <relationPath relationID="Order\Employee" />
      <relationPath relationID="Employee\Orders" />
    </field>
  </detailFields>
</reportDefinition>
```

Fig. 16E

SQL Query Table

```

SELECT bv.OrderID AS fpk_k0,
       0 AS fpk_g,
       bv.OrderDate AS f1,
       q1.f2 AS f2,
       ((q2.auto8) + (bv.Freight)) AS f3,
       q0.f4 AS f4,
       q0.f5 AS f5,
       q0.f6 AS f6
FROM Orders bv

      INNER JOIN
      /* Employee */
      (SELECT bv.FullName AS f4,
             q0.f5 AS f5,
             q0.f6_v / q0.f6_c AS f6,
             bv.EmployeeID AS jk0
      FROM Employees bv

            LEFT OUTER JOIN
            /* Orders */
            (SELECT COUNT(1) AS f5,
                   SUM(((q0.auto19) + (bv.Freight))) AS f6_v,
                   COUNT(((q0.auto19) + (bv.Freight))) AS f6_c,
                   bv.EmployeeID AS jk0
            FROM Orders bv

                  LEFT OUTER JOIN
                  /* Order Details */
                  (SELECT SUM(((bv.UnitPrice) * (bv.Quantity) * (1-(bv.Discount))))
                   AS auto19,
                   bv.OrderID AS jk0
                  FROM [Order Details] bv
                  GROUP BY bv.OrderID
                  ) q0 ON bv.OrderID = q0.jk0

            GROUP BY bv.EmployeeID
            ) q0 ON bv.EmployeeID = q0.jk0

      ) q0 ON bv.EmployeeID = q0.jk0

      INNER JOIN
      /* Customer */
      (SELECT bv.CompanyName AS f2,
             bv.CustomerID AS jk0
      FROM Customers bv
      ) q1 ON bv.CustomerID = q1.jk0

      LEFT OUTER JOIN
      /* Order Details */
      (SELECT SUM(((bv.UnitPrice) * (bv.Quantity) * (1-(bv.Discount)))) AS auto8,
             bv.OrderID AS jk0
      FROM [Order Details] bv
      GROUP BY bv.OrderID
      ) q2 ON bv.OrderID = q2.jk0

ORDER BY fpk_g, fpk_k0

```

Fig. 16F

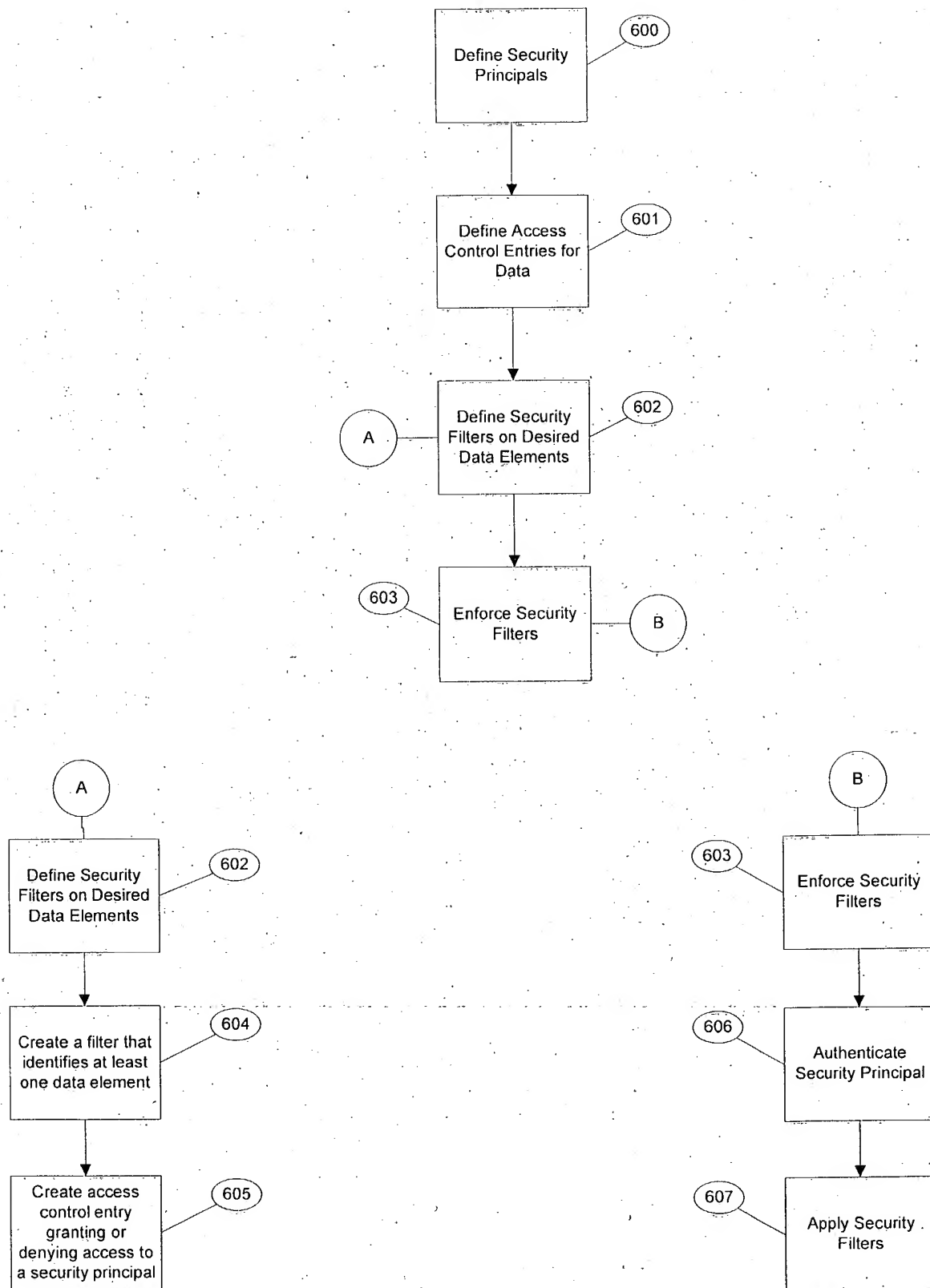


Fig. 17